

THE IRON AGE

A Review of the Hardware, Iron, Machinery and Metal Trades.

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Adv., Page 15.

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THE IRON AGE

New York, Thursday, November 29, 1906.

The Fox Universal Trimmer.

The Fox Machine Company, Grand Rapids, Mich., has recently made some marked improvements in its largest sizes of universal wood trimmers, designated as No. 6 F and No. 8 F. A view of the No. 8 F is herewith shown as Fig. 1. It is especially intended for pattern shops. This trimmer is built on the mechanical principle of a shearing cut. The cut is made by the knife shearing against the point of a gauge which is made to swing in

bearing surfaces under the bed are in parallel lines on either side of the circular slot. As the gauge swings it is constantly held rigid by this style of construction. The pivot on the pivot block comes up with its center directly under the spot where the cutting edge of the knife and the point of the gauge meet. The result is that in swinging the gauge the operator cannot help moving in the true arc of a circle, with the gauge point always at the same exact spot. The construction of the gauge is so rigid that it is possible to set it by the spring taper stop pins without locking it by the clamping lever, and make



Fig. 1.—The No. 8 F Universal Trimmer Manufactured by the Fox Machine Company, Grand Rapids, Mich.

the arc of a circle. The rest of the machine is simply designed to facilitate this shearing operation. It naturally follows that the gauge and knife are the most vital points in trimmer construction.

The trimmer gauge construction is shown in the sectional view, Fig. 2. A pivot block is fitted to the bottom of the gauge by a milled slot and tongue and is then fastened by two heavy screws, thus practically making the gauge and pivot block one solid piece. The broad bottom of the gauge rests flat on top of the bed of the machine. The pivot block passes down through the circular slot in the bed and presents four carefully scraped and fitted bearings to the under side of the bed. The

a heavy cut without springing the gauge a hair's breadth. It has been demonstrated that no amount of wear will impair its accuracy or rigidity. It is an impossibility for the point of the gauge to be sheared off by the knives.

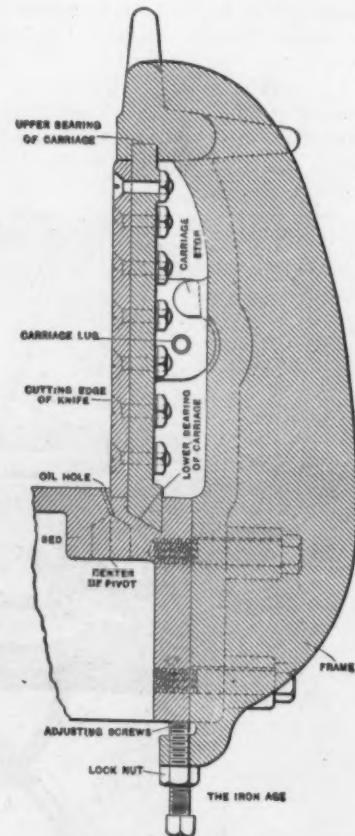
The construction of these trimmers, by which it is possible to adjust the machine to compensate for wear, is shown in Fig. 3. It will be observed that by simply loosening the bolts which attach the main frame to the bed of the machine and turning the set screws in the bottom of the frame a trifle the frame is lowered to a tight bearing. The heavy bolts or screws holding the frame to the bed are again tightened up and the machine is as good as new, as far as the main bearing surface is

concerned. It is essential that this bearing should be tight. Accurate work from a loose bearing is impossible. This method of taking up the wear brings the knife head back to its original vertical position at the same time and by the same operation that the looseness is removed. It will be noticed that the upright frame and the bridge connecting the two upright positions are all cast in one solid piece. This eliminates any spring in the knife head, and together with the adjustability to compensate for wear it makes a perfect construction.

The triangle gauge attachments illustrated in Figs. 4, 5, 6 and 7 are additions to the machine which largely increase its utility. They are shown in connection with the small No. 4 A bench trimmer to economize space. Fig. 4 represents the trimming of a shoulder on a half lap or tenon, sometimes spoken of as trimming into a check. The position of the knives and gauges, both standing at 45 degrees, make it possible to trim down completely to the bottom, leaving an absolutely square, smooth surface. Fig. 5 illustrates cutting a compound angle. A hopper shaped figure or any four-sided figure with the four corners fitted together at a miter and the sides sloping out at any desired angle can be cut. Fig. 6 illustrates the trimming of a wide miter. It is possible to miter a piece on edge as wide as the machine will cut instead of as high as the machine will cut, as is the case without the auxiliary gauge. Fig. 7 shows the easiest and most satisfactory way of trimming an outside miter on a crown or sprung molding. A reverse pattern of the piece of molding 4 or 5 in. long can be made in a few moments' time. A pair of these auxiliary triangular gauges of a proportionately larger size accompanies each style of F Fox universal trimmer. Their utility on the larger machines is even more striking.

The diagram, Fig. 8, shows the way in which every individual degree is laid out on the bed, so that the gauge can be instantly set at any desired angle. This is claimed to be done with a degree of accuracy never before attempted on a machine of this kind. One of the most useful and perhaps the most novel feature on the machine is the segment cutting device, also shown on Fig. 8. Degree lines for 3, 4, 6, 8 and 12 sided figures are extended in length until they meet those radiating from the opposite side of the machine or reach the edge of the bed. On these lines appear graduations, which are at such angle to the radiating line that they will indicate the proper angle at which to trim the ends of the

would be comparatively unsatisfactory. For instance, to hold 12 pieces by hand or ordinary stop gauge so accurately that there will be no variations in length or angle would be almost impossible. In order to produce perfect glue joints it is necessary to have the 12 pieces the same length and at exactly the required angle at both ends. This stop rod or gauge is made of one piece of $\frac{3}{8}$ -in. square steel bar, with a sliding thumbscrew clamp at the back end and a patent head at the front. For the purpose of locating this securely a side brace is furnished, with a similar sliding thumbscrew clamp. The head of this



3.—Vertical Section of the Universal Trimmer Frame, Showing the Adjustment to Compensate for Wear.

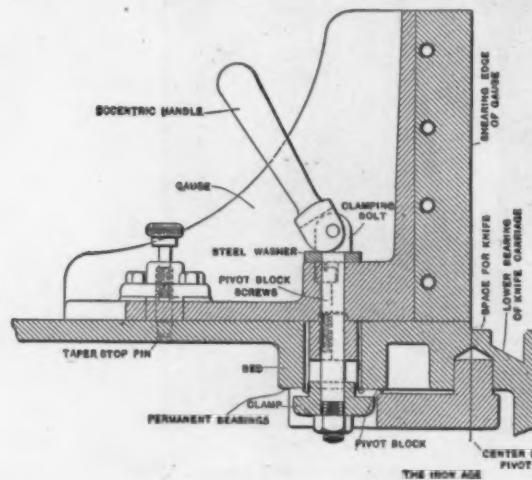


Fig. 2.—Vertical Section of the Fox Universal Trimmer Gauge.

designated number of segments in order to have them produce perfect joints between the ends—that is, they are complementary to the angle produced by the degree lines and the cut of the knife. These graduations are so spaced that in each case they indicate inches of diameter for finished circles of the designated number of segments. The No. 8 F machines have a capacity for handling the work up to 8 ft. in diameter, with 12 segments to the circle.

Without the aid of the company's patent segment stop rod or gauge the use of this diagram stamped on the bed

stop rod gauge is fitted with a compression spring. It has a compression movement of a little over $\frac{1}{2}$ in. At the extremity of the compression head is a floating member, which can be arranged to stand at any desired angle as called for by the different numbers of pieces which are to compose the finished circle. The gauge is located by simply fastening the two thumb screws.

In connection with this segment cutting device the copyrighted plates, as shown in Fig. 9, are immensely valuable. They save head work in laying out as well as hand work in working out patterns. The plates are self-explanatory. On the machines these plates are of etched brass, and attached to the knife guard so that they are before the operator at all times.

In an address at the Engineering and Machinery Exhibition at London on October 4, on "Large Gas Engines," H. A. Humphrey, M. Inst. C. E., said that under favorable working conditions a large gas engine develops a horsepower hour for 0.8 lb. of coal, while a steam engine takes about 2 lb. In Germany, with 24 makers in the field, competition has led to improvements in design. While German and Belgian firms have met heavy losses in their gas engine experiments, the possibilities of these engines have had better appreciation on the Continent, where coal is dearer. The speaker had information to the effect that the use of gas engines and electrical equipment of the rolling mills has reduced the price of finished products 13s. to 18s. a ton. While the list was not complete he had obtained particulars of 531 large gas engines, having a total of 544,240 hp.

The Uses of the Blower in the Foundry.

No device is more vital to the operation of the modern foundry than that by which air, under the requisite pressure, is supplied to the ignited fuel within the cupola. Cupolas may vary in their proportions, and coal, coke and iron in their quality, but under no conditions

3. The so-called rotary blower with close fitting revolving propellers, and,

4. The blowing engine, acting upon the principle of the plunger pump, and capable of producing pressures several pounds to the square inch.

Of these four types, the second, or propeller type, is absolutely valueless for cupola work, because of its in-

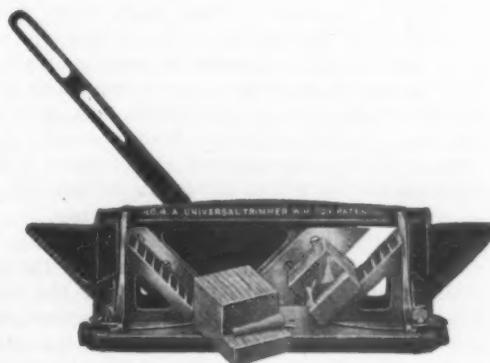


Fig. 4.—Trimming a Shoulder on a Half Lap or Tenon.

can successful melting be accomplished without the employment of some device partaking of the nature of a blower. Although most important, this is by no means

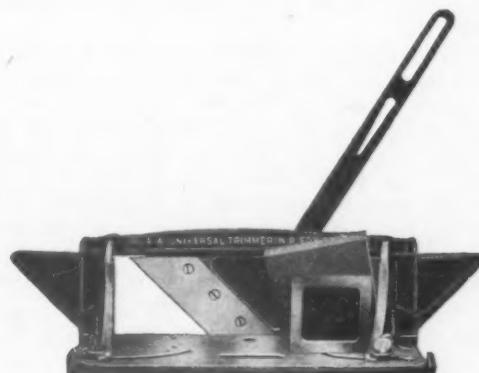


Fig. 5.—Cutting a Compound Angle.

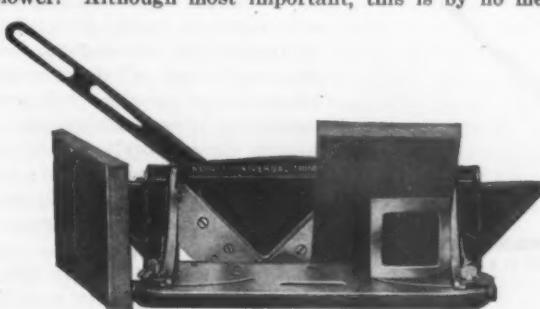


Fig. 6.—Trimming a Wide Miter.

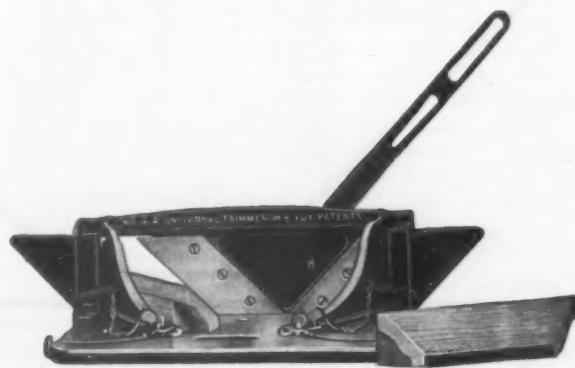


Fig. 7.—Trimming an Outside Miter on a Crown Molding.

How the Triangle Gauge Attachments to the Fox Universal Trimmer Are Used.

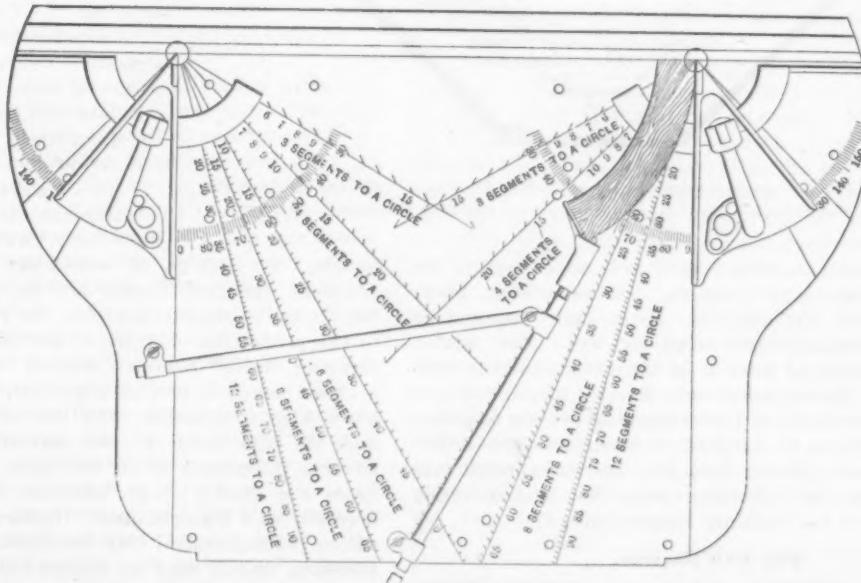


Fig. 8.—The Bed of a Fox Universal Trimmer, Showing the Manner in Which Every Degree from 30 to 150 Is Laid Out on the Bed.

the sole purpose for which a blower is, or may be, employed in a foundry. Under the broad term "blower" may be classed four types of machines, differing widely in their construction and operation:

1. The peripheral discharge fan wheel with enclosing case.
2. The propeller or disk wheel, discharging its air in lines practically parallel to its axis.

bility to produce the required air pressure; while the fourth, or blowing engine type, is too complicated and expensive for use in the ordinary foundry. For all purposes, except blowing cupolas, the fan blower is the only type which is adaptable.

Volume and Pressure.

According to the purpose for which they are designed, fan blowers may be classed either as volume blowers or

pressure blowers, although one type naturally merges into the other. In either type the fan blower, proper, consists in its simplest form of a number of blades extending radially, or nearly so, from its axis and presenting practically flat surfaces to the air as they revolve. By the action of the wheel the air is drawn in axially at the centre and delivered from the tips of the blades in a tangential direction. It is therefore designated as a centrifugal fan, or, more properly, as a peripheral discharge fan.

If volume alone, regardless of pressure, is the requisite, the larger the fan the less the power required. There is a strong temptation, however, for a purchaser to buy a smaller fan and run it at a higher speed; for he sees only the first cost and does not realize the entailed expenditure for extra power. If possible, a fan should never be made so small that it is necessary to run it above the required pressure in order to deliver the necessary volume. To double the volume under such conditions requires eight times the power; three times the volume demands 27 times the power.

For certain purposes, such as the blowing of cupola

ing the dust from tumbling barrels, from emery wheels, and, in fact, for exhausting dust, smoke or objectionable gases from any machine or apartment in which they are generated. For such work the fan is driven at comparatively low speed, and proper connection made to the space or spaces from which the objectionable matter is to be drawn. This passes through the fan and thence to any desired place of deposit and is discharged into the open atmosphere.

In the case of the pattern shop, which usually forms an adjunct of the foundry, a fan of this type in the form of a planing mill exhauster is usually of advantage for the removal of shavings and sawdust. The width of the wheel in such a fan is far greater, both at inlet and outlet, than that of a pressure blower wheel. A large volume of air at comparatively low pressure is thus passed through the fan with a minimum expenditure of power.

For Heating and Drying.

A similar type of fan on a larger scale is used in connection with a steam pipe heater, for the heating and ventilation of the model foundry. By the concentration of all the pipe in a single heater, across which large volumes of air are caused to pass, the amount of pipe is reduced to from one-third to one-fifth of that

which would be required if it were strung around the foundry, as in the case of direct radiation. This concentration of the heating surface also serves to reduce to a minimum all possibility of freezing, renders the regulation of temperature as simple as is possible, and presents numerous other advantages. The heated air is distributed by means of the fan through a more or less extended system of underground ducts, with vertical wall flues or of overhead galvanized iron piping. The large quantity of air thus supplied secures adequate ventilation, causes all air leakage to be outward and serves to keep the foundry comfortable and clear of gas and steam during the heat, if cool or slightly tempered air be then supplied.

A similar form of apparatus, designed to deliver air at high temperature, may be employed for drying flask and pattern lumber, when the quantity is sufficient to warrant the arrangement.

Forced Draft.

Although the boiler plant in connection with an independent foundry is usually of somewhat limited size, nevertheless the fact should not be overlooked that the fan blower is rapidly usurping the place of the chimney in the production of draft, or serving as its assistant in securing desired results. Applied to force the air into a closed ashpit it creates a pressure which makes possible a high combustion rate, the burning of cheap fuel and the attainment of the maximum capacity of the boilers. Employed as an exhauster, through which the gases are drawn, it, in addition, does away with the necessity of a high chimney. Under either form of application perfect control may be maintained over the draft pressure, and it may be automatically increased or decreased coincidentally with a slight fall or rise in the steam pressure, which thus remains almost absolutely constant.

Either as a convenience or as a necessity the fan blower is ever in demand in the foundry, and its forms of application are constantly increasing. It therefore stands to-day as a specific type of machine, whose general advantages and peculiar adaptability are becoming more and more familiar to every manufacturer and engineer.

It is stated that 231 municipal acetylene plants are now in use in this country.

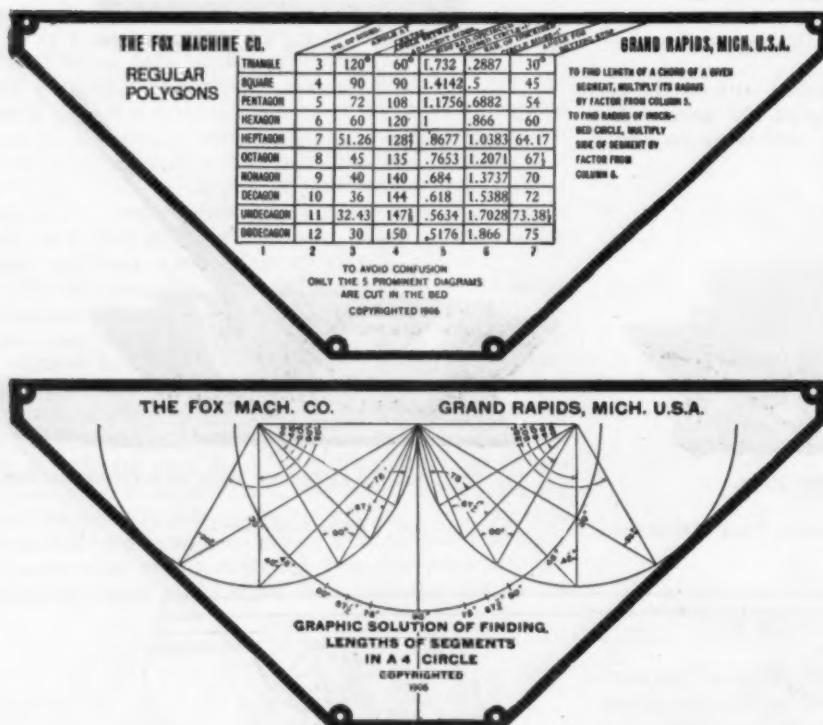


Fig. 9.—Instruction Plates Attached to Every F Fox Universal Trimmer to Save the Time of Workmen.—They Are Copyrighted by the Fox Machine Company.

furnaces, a comparatively small volume of air is required, but under high pressure. For exhausting, blowing boiler fires, and the like, the volume required is greater and the pressure relatively less. The former wheel requires to be narrow at the circumference, thus providing for the escape of only a small amount of air. When a fan is employed for exhausting hot air or gases, the speed required to maintain a given pressure difference is evidently greater than that necessary when cold air is handled, the difference being due, and inversely proportional, to the absolute temperature.

The Fan Blower.

First of all among the different types of fan blowers employed in the foundry is the pressure blower for blowing the cupola. The fan wheel is narrow, with tapering sides, reducing to the minimum width at the outer circumference, where the air escapes from the wheel into the surrounding case. Numerous curved blades or floats serve by their continuous action to prevent the return of this air to the wheel center and thereby maintain the pressure due to their tip velocity.

There are many other uses of the fan blower in the foundry—uses in which it has no practical competitor. Employed as an exhaust fan and properly designed for its work it has found an extended application for remov-

Autogenous Welding with the Oxy-Acetylene Flame.

BY S. D. V. BURR.

In *The Iron Age* of November 1 brief mention was made of the use of the oxy-acetylene blowpipe for the welding of metals. The great heat of this flame, 3500 degrees C., or 1500 degrees above that of the oxy-hydrogen flame, renders it applicable for a wide range of work. The flame can be directed wherever needed without trouble, can be maintained as long as may be desirable, and can be readily regulated according to the requirements of the work. Owing to the interest which the article referred to has aroused, we present in the following a more complete account of the apparatus and method of handling it, and of the work to which the process has been successfully applied.

The one characteristic which has done most to make this process of welding commercially available and which has overcome the objections existing in the case of the oxy-hydrogen blowpipe, has been the introduction of so-called "epurite." This substance when brought into contact with water liberates oxygen, the action being analogous in every respect with that caused by water on calcium carbide, except of course that the one releases oxygen and the other acetylene gas. The oxygen thus obtained is chemically pure and is produced at a cost very much less than the present price of the gas in tanks. Further than this it can be generated wherever and whenever required and in any desired volume; this, as just stated, widens the field of application and does away with the troublesome and expensive handling of cumbersome receivers. The oxygen part of the equipment is by this means brought within reach of all industries having need of it, and the epurite, being absolutely without dangerous properties, is carried by transportation companies at the lowest freight rate granted chemical compounds. One kilogram of epurite yields about 55 liters of oxygen at a temperature of from 59 to 68 degrees F.

Description of the Generating Apparatus.

The acetylene part of the equipment consists of a generator and receiver of the usual form and of such size as may be required by the work in hand. The pressure of both gases at the blowpipe should be about 60 in. of water.

The oxygen generator is charged with epurite and water. A solution of sulphate of iron flows into this generator and acts purely as a catalytic agent for the production of the oxygen. Acting in this manner it facilitates the generation of the gas, and of course has no effect upon the purity of the product. From the generator the oxygen passes to a holder from which it is compressed to a pressure of 10 atmospheres by a compressor which delivers the gas to a third tank, from which it is led to the blowpipe, first passing through a gas regulator which reduces the pressure to 60 in. of water.

For some kinds of work a higher pressure than this is required. This is particularly true in the cutting of thick plates with the blowpipe when it is necessary to carry the flame down into the kerf as the cutting proceeds. This will be understood when the statement is made that the flame can be used at a distance of 15 to 18 in. from the outlet of the blowpipe, and the high pressure is required in order to obtain this carrying power. The pressure of 60 in. of water has been determined so as to be assured that the speed of the mixture at the outlet of the blowpipe would be sufficient to counteract the possibility of the gases burning back before reaching the exit.

The Flame.

When starting the blowpipe the acetylene valve is first turned on full and then the oxygen is admitted until the flame has only a single cone. An excess of acetylene is indicated by the flame assuming a white color and by the appearance of two cones; the flame is then a carbureting one, and if the metal heated is steel sparks will be emitted, thereby indicating the formation of cast iron. An excess of oxygen is shown by the flame having a violet tint and the heated metal being very bright.

No flux is required for the welding of any metal and the joint is formed by the perfect metallic union of the parts, which are actually fused together. Oxidation of the metal heated is impossible, and it is to this fact that the success of this process is mainly due. This will be perfectly understood when the temperature of the flame is considered. At 3500 degrees C. the dissociation point is passed and the water and carbonic acid resulting from the reaction are dissipated; their formation cannot take place within the direct influence of the flame. The molten metal is protected by the hydrogen and carbonic oxide generated, and neither oxidation nor carburization is possible within the flame. These two gases, escaping from the flame, are burned into water and carbonic acid by the surrounding atmosphere.

The gases are consumed in nearly equal volumes, the acetylene being 1 to 1.1 of oxygen, the excess of the latter being principally due to the consumption during the regulation trials. Welding steel sheets from 1-25 to 3-25 in. thick requires from 100 liters to 250 liters of both gases per hour, and for plates 3-5 in. thick the consumption is 1150 liters. Sheets 3-25 in. thick can be welded at the rate of 60 in. per hour, and sheets 3-5 in. can be welded at the rate of 15 in. per hour.

During the process of welding the apex of the cone is kept about 2-25 in. from the metal. The edges of the metal are fused and at the same time the joint is slightly overloaded by melting a rod of the same metal in the flame. In appearance the joints made in this way bear a very strong resemblance to the ordinary burned joint made in lead—there is the same flowing or wavy appearance of the metal. The unfinished joint is stronger than the body of the metal, and the finished joint has 95 per cent. of the strength of the original metal.

Application of the Process

The process has been successfully applied to the welding of steel and composition plates, in the making of tanks and boilers, for much of the automobile work that was formerly done by brazing, and for the making of angles, T's and Y's in pipe. Iron, steel, copper, brass and cast iron have been effectively welded. In welding thick pieces it is necessary to bevel the edges, and in brass and some other alloys the joint is filled with borax moistened with water; this is done not as a flux but to prevent the zinc, which is volatilized, from being deposited on the welded part.

This flame has been used to cut metals, and for this purpose it has been found to have many advantages, since the flame, owing to the pressure at which it issues from the blowpipe, can be greatly elongated. It can therefore be made to penetrate to the bottom of the cut as the work proceeds. In cutting steel 5 in. thick the kerf is only about $\frac{1}{4}$ in. wide. The action in no sense resembles that of the oxy-hydrogen flame which has been perfected recently by a Belgian engineer, as was described in *The Iron Age* of November 1. In that process the iron was first reduced to an oxide and the oxide was then melted, the success of the method depending upon the fact that the oxide melts at a lower temperature than the pure metal. In the oxy-acetylene process the metal itself is melted by the tremendous heat of the flame and it flows from the cut as a pure metal.

The oxy-acetylene process is handled in this country by the Industrial Oxygen Company, Hanover Bank Building, New York City.

Gas cleansing fans of the centrifugal water spray type, made by the Buffalo Forge Company, Buffalo, N. Y., are meeting with success, as evidenced by the fact that the Carnegie Steel Company has placed an order for 10 full housing right hand bottom horizontal discharge fans, with two inlets arranged for suction from above, to be used at the Carrie furnaces. These fans are each to handle 15,000 cu. ft. of gas per minute, and are almost exact duplicates of those recently installed at the Edgar Thomson furnaces.

The Southern Pacific Company's purchasing department's address will be Flood Building, San Francisco, Cal., commencing November 30.

An Extra Heavy Newton Slotter.

A new extra heavy all geared slotting machine, which is probably the heaviest of its type on the market, has been designed and built by the Newton Machine Tool Works, Philadelphia, for one of the large shops in the Pittsburgh District. It is also believed to be the first arranged with pneumatic clutch drive. The ram has a full stroke of 33 in. and is driven through compound gearing by a 10-hp. variable speed motor, the reversing being effected by the pneumatic clutches. The rack of the ram is steel, 5 in. face, and is operated by a steel bull wheel. The ram is counterbalanced by a weight running at the back of the machine and is fitted in a hood which is adjustable vertically on the bar, being used in a low position for heavy cutting. The ram is also fitted with a relief tool block. The machine shown in the illustrations, Figs. 1 and 2, is driven by a Ridgeway motor having a feed variation of 5 to 1. The circular carriage is 48 in. in diameter over the tee slots and 56 in. in diameter over all, and has an in-and-out and a cross feed of 40 in. The circular table is furnished with quick acting variable feed motion in all directions, the in-and-out, cross and circular motions being all controlled from the carriage, so that the operator can stand in one position and direct all three movements. The distance from the face of the ram to the frame is 36 in. and the machine will admit work 34 in. high above the circular table. Its approximate weight is 35,000 lb. The driving bull wheel is 24½ in. in diameter and has 47 teeth.

A detail of the pneumatic clutch, which is the invention of John Riddell, is given in Fig. 3. The position it occupies on the machine is shown in Fig. 1. The pinion on the motor meshes directly with the rawhide gear *a*, through which the intermediate shaft *b* is driven by the gear *c*. The other gear *d* on the shaft *b* and the gear *e* provide the two driving speeds for the up and down motions of the ram, each gear meshing with a gear free to revolve on the shaft *g* when the double clutch is in its central position. The gear *e* gives the slower speed for the cutting stroke, and the gear *f* the quick return. As the gears *c* and *e* fix the distance between the shafts *b* and *g*, it is necessary to use an intermediate gear between *d* and *f* (not shown in the line drawing, Fig. 3) to transmit the drive. This is made clear in Fig. 1. With the clutch in one or the other of its positions to the left or right, the shaft *g* is driven in forward or reverse directions, and through a pinion at its left hand end drives the ram actuating gearing in the manner shown in Fig. 1.

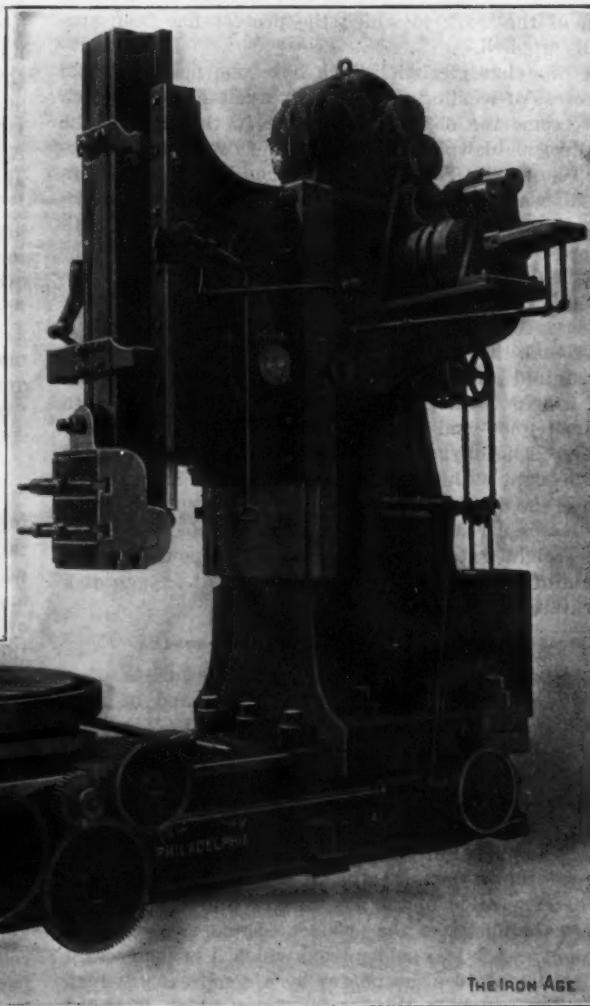
The operation of the clutch is as follows: Air is admitted by a two-way valve, which may be seen in Fig. 2, to either of the inlets *h* and *i*. The latter connects through a small pipe *j* with ports in a piston which is a part of the shaft *g*. Admitting air to the left hand face of it causes the clutch to travel in that direction, engaging the part of the clutch associated with the gear *e*. This is the movement which produces the down stroke of the ram. The ram having reached the lower limit of its stroke, as determined by an adjustable dog, a lever connected with the two-way valve is thrown, reversing the flow of air so that it enters at *h*. This opening connects through an annular passage surrounding the tube *j* with ports leading to the right face of the piston. Pressure in this space causes the clutch to be thrown to the opposite side, engaging the gear *f* with the shaft *g*, and operating the ram for the quick return.

In the intermediate positions both members of the clutch are disengaged, allowing the spindle *g* to stand

still while the motor continues to run. This corresponds to a condition when either no air is admitted to the clutch or when the pressure on both sides of the piston is balanced, and the manipulation of the actuating lever by means of the handle shown in Fig. 2 accomplishes this result. The construction of the clutch is well brought out in the line drawings, showing the attachment of the segments of apple wood for the friction surfaces of the clutch. The speed is designed so that the intermediate shaft runs at about 840 rev. per min., corresponding with a cutting speed of 30 ft. per min. on the down stroke of the ram. The return is faster in the ratio of 1 9-10 to 1.

◆◆◆

Surface condenser tests on an elaborate scale have shown that it is conducive to efficiency to intercept and



THE IRON AGE

Fig. 1.—The Operator's Side of the New Extra Heavy Slotter Built by the Newton Machine Tool Works, Philadelphia.

remove the water of condensation from the condenser as soon as possible after it is formed; also that the condenser capacity should be a minimum consistent with the accommodation of the necessary surface, and that the design should be such as to secure a pervading and uniform flow of vapor throughout the condenser section, thus utilizing the whole of the condensing surface provided, as well as obviating stagnant recesses in which air might be retained; further, that the condensing water should travel at a fairly high speed through the tubes and that it should enter at the bottom and leave at the top of the condenser. With suitable condenser design and proportions, and in conjunction with dry air pumps, a condensation rate of 20 lb. of steam per square foot of surface per hour will be maintained in association with 28½-in. vacuum, and a quantity of condensing water equal to 24 times the feed water, at an inlet temperature of 50 degrees F. Under the above conditions and in conjunction with dry air pumps a condensation rate of 35 lb. of steam per square foot of surface per hour will be maintained in association with a vacuum of

28½ in., and a quantity of condensing water equal to 28 times the feed water, at an inlet temperature of 50 degrees F.

Undue importance has been given in some published statements recently to discoveries of manganese ores in

discovery of manganese in large quantities" is subject to a very heavy discount.

A powerful rotating tower crane, operated by electricity and dealing with normal loads up to 160 tons, has recently been erected for the Port and Docks Board of Dublin, Ireland. The rotating part consists of a vertical crane post, with a horizontal braced truss over it. The lower part of the crane post rests on a cylindrical bearing, while the upper horizontal thrust is borne by rollers on a ring bearing fixed to the trestle surrounding the crane post. The machinery for hoisting and traversing is housed in a room which, together with the counterweight, is erected on the short arm of the truss. The greatest height of the load hook above the quay wall is 70 ft. The hoisting height is 100 ft. The radius for the auxiliary lift of 20 tons is 80 ft., that for the main lift of 160 tons being 75 ft. The crane will lift 150 tons at the rate of 3 ft. per minute, 50 tons at 10 ft. per minute, 20 tons at 20 ft. per minute. The main and auxiliary lifting motors are of 60 and 40 hp., respectively; the traversing motor 130 and the slewing motor 15 hp. They operate on 500-volt direct current circuits.

As an example of the saving in room occasioned by the use of steam turbines, the case of the Kent avenue power station of the Brooklyn (N. Y.) Rapid Transit Company has been cited. The 5500-kw. turbo generator installed there takes up in itself a much smaller space than would be required for a reciprocating unit of similar capacity. Not only this, but the decrease in the necessary size of foundations is noteworthy. The machine is supported upon concrete piers about 3 ft. square, upon which rest steel and concrete girders, to which the machine is bolted. The condenser is directly beneath the low pressure end, and the room available around and between the piers gives sufficient space for all the auxiliaries, without encroaching at all upon the main

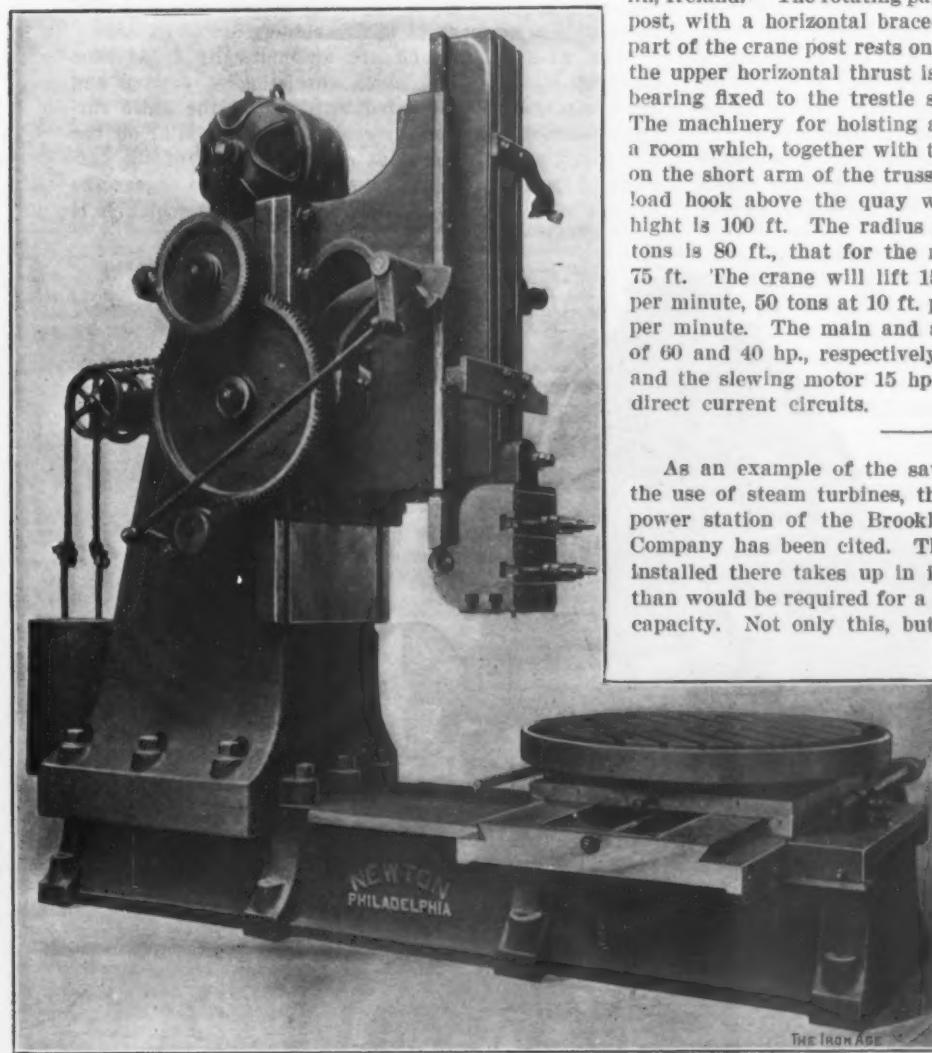


Fig. 2.—View of the Opposite Side of the Newton Slotter.

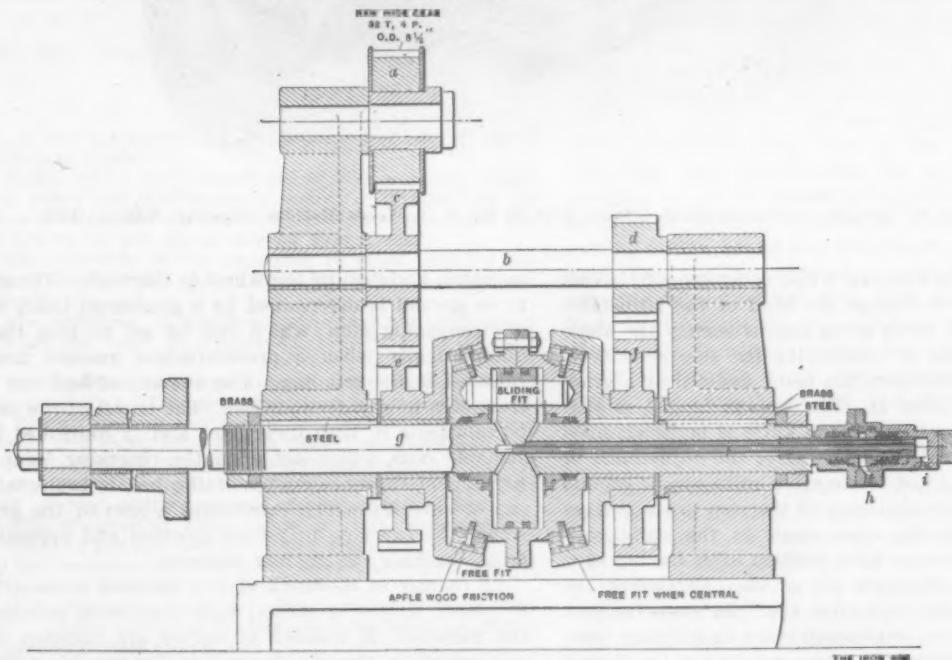


Fig. 3.—Cross Section of the Riddell Pneumatic Clutch Used on the Newton Slotter.

West Virginia. From what has long been known of the thin and unprofitable veins of these ores occasionally met with in that State, the recent announcement of "the

floor. The saving effected affects floor space, cubical contents, cost of foundation and wall construction of the power station.

The Woods Improved Knife Grinder.

The new automatic knife grinder, No. 226, built by the S. A. Woods Machine Company, Boston, Mass., for grinding wood planer and other machine knives, embodies a number of important changes and improvements. The general design of the machine has been materially altered and a number of features have been introduced to increase its efficiency and the scope and the excellence of its product. The grinder, of which Fig. 1 shows the general appearance, is built in two sizes, taking knives of a maximum length of 30 and 42 in., respectively.

An important addition to the machine is a device which provides for the exact duplication of knife bevels, as shown in Fig. 2. On the end of the knife bar, or rest,

cone pulleys has been substituted for a chain drive, the second steps being used to speed up the grinding wheel when it becomes reduced in size. A swinging tightener pulley takes up the slack and permits the use of an endless belt. The hood has been made adjustable transversely on planed ways, so that it may be retracted with respect to the decreasing diameter of the wheel as it wears. The water tanks are removable for cleaning, and are hung on the back of the machine.

The wheel and stand are automatically fed to the knife by a cross feed device, consisting of a pawl and ratchet mechanism actuated by dogs on the knife carriage, one of the dogs depressing the roll stud on the arm containing the pawl at each movement of the carriage to the right or left, causing the pawl to engage the ratchet wheel, turning it and the screw on which it is

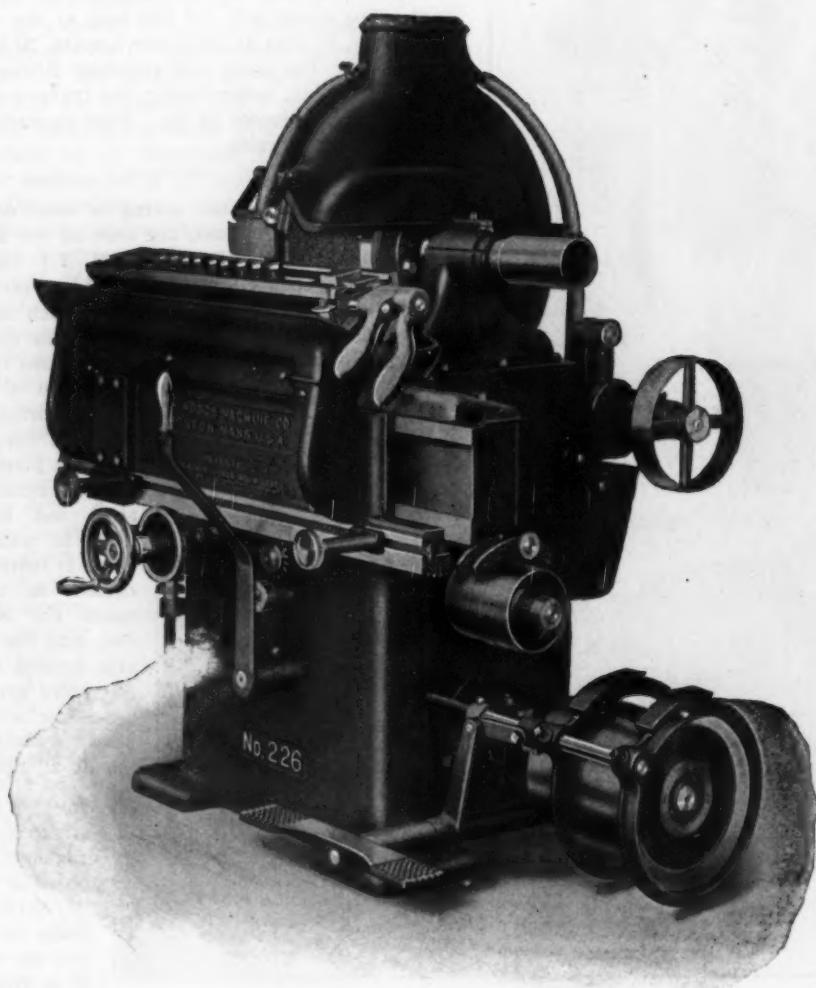


Fig. 1.—The No. 226 New Automatic Knife Grinder Built by the S. A. Woods Machine Company, Boston, Mass.

to which the knife is clamped while being ground, is cast a plate, D, notched to engage the head of the adjustable threaded stop C. A notch gives approximately the angle desired, and screwing or unscrewing the stop permits of exact adjustment, this operation being assisted by a graduated scale on the plate D. The stop is hinged so that it may be thrown back while the knife is being clamped to the rest or removed from it. After the adjustment of an angle is once obtained knife after knife can be ground to the exact angle, the replacing of the stop in the correct notch always giving the same angle to the knife rest, when it is returned to working position after having been thrown over for replacing the work. Extending the length of the knife rest is a pivot shaft, between the supports of which the rest is clamped when in grinding position. The shaft is threaded on one end, and on the thread is loosely mounted a handle nut, A, which when turned draws the shaft to the right, binding to it the supporting standards. The rest is operated by the handle B.

A belt drive for the grinding wheel with two-step

mounted, and feeding the wheel to the work. The amount to be ground is determined by a graduated index having a disengaging stop, which can be set to stop the feed automatically when a predetermined amount has been removed in the grinding. The amount of feed can be set from zero to any desired feed. The travel of the carriage is automatic in both directions, and is controlled by adjustable dogs which act upon the reversing lever. The top of the supporting way of the bed is protected by a cap or covering which constitutes a part of the guide to retain the carriage in proper position and prevents grit from reaching the guiding surfaces.

A feature of the work of this machine is the grinding of planer knives, a special knife bar being provided for the purpose. A number of knives are clamped to this bar, which in turn is clamped to the regular knife bar.

The wheel stand and countershaft boxes are of a patent side wing clamp type with ring oiler. The cap of the box, instead of being forced down upon the shaft, finds its own position and is there locked from the side.

The Holding Power of Railroad Spikes.

In Bulletin No. 6 of the University of Illinois Engineering Experiment Station, Roy I. Webber, instructor in civil engineering, gives the results of experiments to determine the resistance to withdrawal offered by the same type of spike in different timbers and by different forms of spikes in the same timber, and to determine whether timber preservative has any influence upon the resistance. The conclusions of the author are summarized as follows:

1. The maximum resistance to direct pull varies from 6000 to 14,000 lb. for screw spikes, from 3000 to 8000 lb. for ordinary spikes, when driven into untreated timbers, and from 4000 to 9000 lb. for ordinary spikes when driven into treated timbers.
2. The direct pull required to withdraw ordinary spikes $\frac{1}{4}$ in. varies from 2000 to 3500 lb. for untreated timbers, and from 2500 to 3500 lb. for treated timbers.
3. The direct pull required to withdraw ordinary spikes $\frac{1}{4}$ in. varies from 3000 to 5400 lb. for untreated timbers, and from 3500 to 5900 lb. for treated timbers.
4. Timbers having loose fiber structures have lower resistances to direct pull than timbers having compact fiber structures.
5. The amount of withdrawal which must occur for ordinary

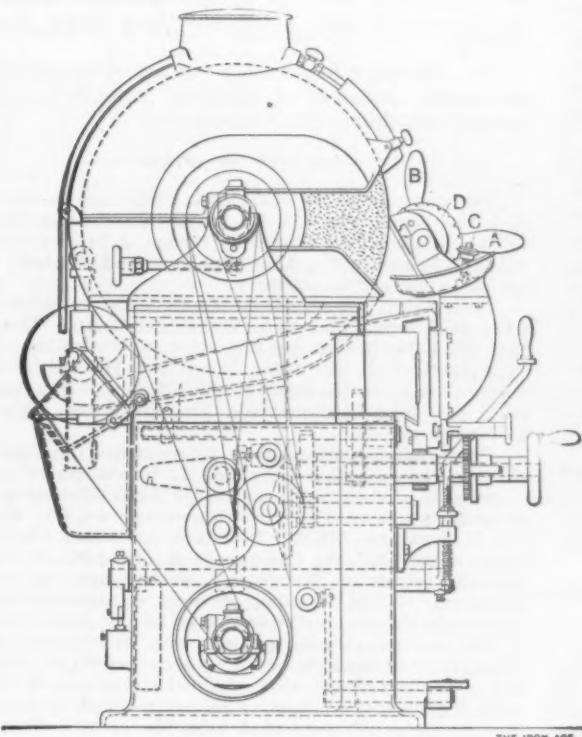


Fig. 2.—End Elevation of the New S. A. Woods Automatic Knife Grinder.

spikes to develop the maximum resistance is less for soft woods than for hard woods.

6. Spikes driven into treated timber offer a greater resistance to direct pull than spikes in untreated timbers, and the difference between this resistance for treated and untreated timbers is greater for soft woods than for hard woods.

7. The difference in the resistance to direct pull for the different sized spikes in use (9-16-in., 19-32-in. and $\frac{5}{8}$ -in.) is very small.

8. The resistance of ordinary spikes to direct pull varies directly as the depth of penetration, neglecting the tapering point.

9. Blunt pointed and bevel pointed spikes have a slightly greater resistance to direct pull than chisel pointed spikes.

10. For withdrawals less than $\frac{1}{4}$ in., ordinary spikes which are driven into bored holes have a little greater resistance to direct pull than spikes driven in the ordinary way.

11. The resistance to direct pull for redriven spikes is from 60 to 80 per cent. of the resistance of newly driven spikes.

12. The efficiency of screw spikes to resist withdrawal is nearly twice as great as that of common spikes.

13. The resistance of $\frac{5}{8}$ -in. spikes to lateral displacement is slightly greater than that of 9-16-in. spikes.

14. The resistance to lateral displacement increases with the depth of penetration, but the increase is negligible for depths of penetration greater than 4 in.

15. Screw spikes are more efficient than ordinary spikes in resisting lateral displacement.

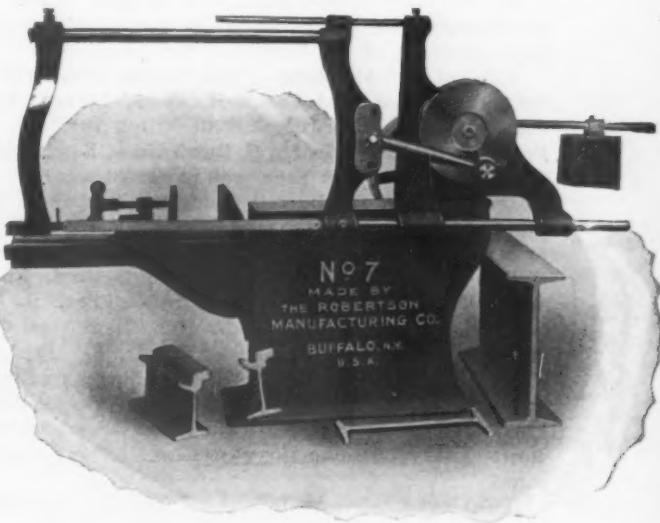
Of the 90 screw spikes used in making these tests only two were broken. One was broken under a tension of

14,000 lb., the break being caused by an incipient crack just under the head of the spike. The other spike broke under the fourth blow of the hammer, this break being due to uncombined graphite in the metal. As the spikes were obtained from different sources, and were of different manufacture, it is thought that the test was sufficiently severe to show that the screw spike, as manufactured at present, will successfully withstand the shocks of passing trains.

The Robertson No. 7 Rapid Cut Power Saw.

The accompanying illustration shows the Robertson No. 7 rapid cut power saw, having a cutting capacity of 12 x 17 in., just brought out by the Robertson Mfg. Company, Buffalo, N. Y. Owing to the very large capacity of this machine the design is varied somewhat from the regular machines made by the company.

The base is of the box pattern, on which the head casting is bolted, both surfaces being planed. On the head is a large hub forming the support or bearing for the slide bar bearings, connecting the saw frame and having a guide bar extended at the top. A forked opening engages the frame to keep it in alignment. The crank



The Robertson No. 7 Rapid Cut Power Saw.

wheel is mounted on a shaft extending through the head bearing on which the drive gear is secured, engaging with a pinion on the pulley shaft. The gears are cut from the solid metal, with tight and loose pulley for a 2-in. belt, with a speed of 120 rev. per min. The knee for holding the work is planed and has ways provided to run in bearings planed on the face of the base, thus providing for large work and keeping the angle of the frame in position to get the benefit of gravity feed. The knee is secured to the base by a bolt in a slot in front of it. In cutting beams, angles and large work bolts and straps are used, the knee having holes at equal distances. A vise is also furnished that will hold work up to 12 in. A special knee is also made for this machine at a small additional cost in the form of a holder for sawing the openings in crank shafts, for which work this machine is specially suited. The feed is gravity and is variable by the counterweight.

The Lukens Iron & Steel Company, Coatesville, Pa., has enlarged its steel making capacity by the addition of three 50-ton open hearth furnaces. The company has further recently completed its new flanging department, which enables twice as much machine flanged work to be turned out as formerly and of a heavier character. Some very heavy machine flanging of marine boiler plates and other such work has recently been done. The output of the company's plant is larger now than ever before, having amounted to over 200,000 tons of plates for the business year ending October 31.

The Leather Belting Manufacturers' Association.

A representative gathering of leather belting manufacturers attended the annual meeting of the Leather Belting Manufacturers' Association, held in the Fifth Avenue Hotel, New York, on Wednesday, November 21. The session began early in the afternoon and a large part of it was given up to a discussion of the price list, which was finally revised, and the new schedule which went into effect the following day shows a general increase of 12½ per cent. This, coupled with the advance of 10 per cent. made last year, has increased the price of leather belting nearly 25 per cent. more than it was two years ago. The Executive Committee, which had the advance under consideration, reported that the unprecedented high price of belting butts made it necessary to adopt a new list, and the committee advised the adoption of a rate based on 24 cents per inch for all widths. The association adopted some amendments to its constitution, the most important of which was the addition to section 2 of a clause including all of the dependencies of the United States and British North America in the association's jurisdiction. It was decided to add two members to the Executive Committee, making seven on that body in all, and two vice-presidents, making three in all. The constitution was also amended making the vice-presidents members of the Executive Committee.

Edward P. Alexander, Philadelphia, Pa., was re-elected president, and Frank H. Croul, Detroit, Mich., was re-elected vice-president with Milton H. Cook, San Francisco, Cal., and George B. Rowbotham, Boston, Mass. George H. Blake, New York, was re-elected secretary and treasurer. F. A. M. Burrell, New York, and C. G. Neff, Cincinnati, Ohio, were the two added members of the Executive Committee, and the rest of the board was re-elected as follows: Charles T. Page, Concord, N. H.; Walter M. Spaulding, Worcester, Mass.; Frank B. Williams, Dover, N. H.; George F. Hull, New York City; Robert N. Hathaway, Fall River, Mass.

The following were admitted to membership: Chicago Rawhide Mfg. Company, Chicago, Ill.; Eagle Belting Company, Cincinnati, Ohio; Henry C. Hunt Company, Boston, Mass.; Sadler & Haworth, Montreal and Toronto.

C. O. Alexander, Philadelphia, presented the following resolution, and it was unanimously adopted:

Resolved, That this association pledges itself to advocate and forward, by all lawful means within its power, the enactment by the Congress of the United States of such legislation as shall require all railroads to be bound by a time limit on all local and interstate shipments, conforming to the length of haul and with a percentage of discount on freight bill, payable to consignee, for each 24 hours delay, beyond the daily movement prescribed by said legislation. Also that a copy of this resolution be forwarded by the secretary to T. Payton Giles, Richmond, Va., who with John Donnan is actively engaged in bringing this agitation to a focus.

The resolution was presented at the end of an address by Mr. Alexander on

"Delayed Freights,"

which was in part as follows:

Mr. Alexander's Address.

We, as shippers, are deeply interested in the question of prompt freight deliveries, and representing, as we do, interests whose sales cover not only large portions of it, but in many cases the entire country, we are concerned to know how we may be rid of this aggravating and exasperating condition, by which we are held in abject servitude to the railroads, to whom we must look for the distribution of our goods. This association represents interests which are peculiarly handicapped by slow local and interstate shipments. Our business is such that in manifold cases we are compelled to guarantee prompt delivery. Great industries are often hampered or crippled awaiting the delivery of belting which means power to the plant.

A mill may easily run without a machine, or many other things which, although embarrassing at the time, do not mean paralysis to the entire organization. Our business, however, is one which in many cases means life or death to a great manufacturing institution. How many of us have been up against the instant delivery of a large main drive, or the repair of a damaged one, where delay in ship-

ments of material and tools meant large amounts to the concerns we were serving?

Says Railroads Are Not Fair.

Why, therefore, is all this? we ask. And the only reasonable reply, in the light of facts, is that the railroads do not give us fair play in handling our shipments—that they do not "deliver the goods."

This matter, as I conceive it, has nothing at all to do with politics, investigations nor with the present deplorably popular pastime of persecution and prosecution. It is no fad nor fancy. We are interested not at all in who gets the freight moneys nor with what they do with them—we are interested solely and entirely in seeking quicker deliveries at the earliest possible moment. It is simply a question of fair play—of getting the service for which we pay and pay well.

The entire manufacturing and commercial interests of the country are suffering from unreasonably slow freight transit, and up to the present there has been no adequate agitation looking toward relief. The efforts of the individual shipper and consignee have failed to get redress. The vested interests against which we must move are enormous. The corporate power of the roads is fabulous in its strength, the task is a titanic one; but if well organized and well handled by competent leadership there is without question power enough in the hands of the shippers to demand relief and to get it—to get at least reasonable service from the common carriers, which have their living from our clientele.

Mr. Alexander here read a number of statements giving specific instances of negligent methods pursued by railroad companies, and continued:

Some Delivery Figures.

You can readily see that these conditions are not local; that they exist alike on the single, double and the four-track systems of the Southern, Boston & Maine, Boston & Albany, Pennsylvania, Erie, St. Paul and, in fact, on all the large roads in the country.

Data taken from actual figures show such deliveries from Richmond, Va., as: To Ashland, Ala., May 8 to May 24, 1906, 16 days for 654 miles, or 40.8 miles per day; to Millboro, Del., 321 miles, seven days in transit, or 45.8 miles per day; to Norwood, N. C., 273 miles, eight days, 34.1 miles per day; to Coatesville, Pa., 250 miles, eight days, 31.2 miles per day.

From actual working time tables taken from the roads showing the scheduled movement of freight trains we have an average on four Southern roads of 437.52 miles per day, or 18.23 per hour. The Southern shows 440.40; Washington & Southern, 550.08; Seaboard Air Line, 356.52; Atlantic Coast, 361.20; Chesapeake & Ohio, 361.20; and on the other roads of the country, in interstate deliveries, a movement of 338.18 miles, allowing one-quarter time for reasonable delays, excluding delays at the initial points.

But we are actually getting, with our boasted railroad strength, the meagerly daily average of 61.61 miles, or 2.57 miles per hour—about half the rate you or I could walk, less than the rate of canal boats drawn by horses and far under the old stage road rates.

It is very evident, therefore, that the large proportion of delay can be found at the initial points. Goods are held unreasonably long at the starting points. At all division and junction points and terminal and transfer stations goods are held up and delays ignored.

Again, at transfer points where rival roads pass on goods from one system to another freights are held for no other reason than the hampering and embarrassing of rival roads. The shipper and consignee must stand the racket of delays and hold-ups that one road may hamper its rival.

The roads in self-defense claim want of equipment and inability to keep pace with the requirements of a largely increased demand. If the railroads have not the equipment to-day as to rolling stock and terminal facilities it is largely their own fault. They have had adequate time in which to readjust themselves to what is, without doubt, the largest manufacturing impulse this country or any other country has ever seen. If such is the reason, why is it that they seem to find little trouble in moving perishable goods, on which they have to pay if such are spoiled while in transit? Why is it that certain classes of freight find certain and prompt delivery, while non-perishable goods are held? There can be but one answer—namely, lack of organized demand that such intolerable conditions should be abolished.

When we think of the enormous value of freight continually in transit and the capital it represents we realize that 6 per cent. of the seven days' average of uncalled for delays is a sum of tremendous proportion. Freight en route is so much capital absolutely out of commission for the time being, our share of which we all must pay.

Were this all it would be bad enough, but the worst feature is the restriction of our fields of activity, the curtailment of our possible territory, because of inability for quick

competition. In many trades this condition is so acute as to make it almost prohibitive.

A Suggested Remedy.

It is useless to agitate or discuss unless there is possible redress—unless by some means we can force the remedy, for we have proof enough to warrant the unbiased statement that the roads are not giving us service in anywise commensurate with their present facilities.

Penalize the railroads for undue and unreasonable delays and the nuisance will be largely abated. We do not want unjust regulations nor unfair demands. But why is it not in the province of the great body of shippers, from whom the railroads receive their living, to demand that freight shall have a guaranteed movement of, say, 150 miles per day, and that for all time over this the roads shall be compelled to refund a certain percentage on the freight bill? The railroads themselves already recognize that penalization is the only satisfactory method, for they demand demurrage for cars held unloaded over a certain time and storage on goods not taken from depots within 48 hours. It's a poor rule that won't work both ways. Such a forfeit would work marvels and would result in a tremendous readjustment of freight deliveries.

Samuel Fleischman of the legal firm of Fleischman & Fox, New York, addressed the association on the subject of

The Advantages of Trades Association and Credit Co-operation,

which was, in part, as follows:

To-day the advantages of trade association are becoming widely recognized, and the members of such associations are growing yearly. There are, however, many trades still unorganized, and of the associations in existence many are mere forms without substantial usefulness to their members, because the latter have not had brought home to them the knowledge of the great possibilities for common benefit afforded by united action. The tendency of trade associations has been to overthrow the barriers heretofore separating the individual members of the trade, to draw each member from his entrenched stronghold to a common camp, enlisting under one banner, forming part of an army for mutual support and defense. It has brought those of the same trade into closer acquaintanceship and compelled recognition of the fact that a competitor is not altogether a bad fellow.

Every trade is hampered and its members are annoyed by evils and abuses which have been permitted to take root, expand and accumulate so as finally to become a serious menace to its vigorous prosecution. At first tolerated, they have in the course of time secured a firm grip, extended in all directions and become a settled practice, not to be eradicated except by united and heroic measures. These evils are generally of three classes:

1. Those created by the members themselves, occasioned by unhealthy competition and unsystematic methods of trade, through eagerness to get business, lack of confidence in one another and the want of the elevating influence exerted by a recognized sentiment for betterment in the trade. They include all methods of unfair competition, unreasonable terms of credit, loose credit systems, inducements for the procuring of business and various other abuses incident to the several trades which lower the tone of business and make its prosecution uncongenial and unprofitable.

2. Those created by unreasonable demands or practices of customers, which I shall not here attempt to specify, as they vary according to the trade; but their existence is a recognized crying evil in every trade, and they are tolerated only because of the awe inspired by a customer in the average dealer and his want of pluck to assert his rights.

3. The oppressions and injustices suffered at the hands of those from whom goods or supplies are purchased.

Every trade should organize for its own protection and the advancement of the common interests of its members. The association should devise measures tending to eradicate all evils oppressing the trade, avoiding, however, unnecessary interference with the liberties of members in the management of their own business. Why let each member suffer individually when by a combined action all may be relieved, with detriment to none? The operations of the association will likewise elevate the business ethics of the trade, educating the weaker up to the higher standards maintained by the best class of houses.

But it may be claimed that such associations, if vigorously active and of authoritative influence, may lay themselves open to the hostility prevailing against certain kinds of combinations and so-called trusts. There is much loose talk upon the subject, indicating a woeful lack of differentiation between unlawful combinations meriting condemnation and those organized for legitimate purposes and advancing common trade interests and the commerce of the country. Where combinations in business are formed for the purpose of enriching the promoters and mulcting the public by foisting upon them watered stock at fictitious values, or to

suppress competition and monopolize trade, unduly advance prices, reap unconscionable profits at the expense of the consumers, at the same time denying to employees fair compensation, and where they seek to further their private enterprises by controlling or influencing legislation and public officials, destroying faith in the integrity of the representatives of culture and wealth, clearly unrest and a desire for change and for the overthrow of parties thought responsible for such conditions must ensue.

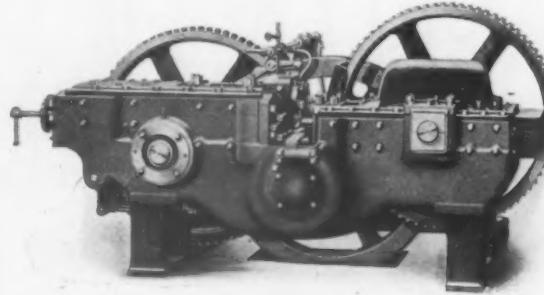
But trade combinations organized to encourage expansion of trade instead of monopolizing it, to remove abuses, create a healthy competition, bring members into friendly relations, encourage honesty and fair dealing, protect members from unjust and unfair discrimination, raising the standards of the business, improving the conditions of employees, co-operating to induce public authorities to enforce the laws impartially and to promote the welfare of the communities wherein they are located, will command the respect of the people and prove conservators of industry, of law and order.

A model institution of the kind last referred to is the National Association of Clothiers, the foundation for which was laid by the organization of the Clothiers' Association of New York in the year 1883. Its history is one of continuous advancement on consistent lines, with constantly increasing usefulness and satisfaction to its members, until now it comprises almost the entire clothing manufacturing trade of this country, with a membership of 236 firms, representing the clothing markets of 14 cities.

Milton H. Cook, San Francisco, gave an interesting talk on the recent earthquake and fire in that city. There was an informal banquet at night, at which the president acted as toastmaster.

The New National Nut Machine.

Among the more recent products of the National Machinery Company, Tiffin, Ohio, is the improved center feed



The New National Nut Machine Built by the National Machinery Company, Tiffin, Ohio.

nut machine shown herewith for making square and hexagon hot pressed nuts. It is calculated to overcome some of the annoyances heretofore connected with the operation of such equipment. It is very heavy and all parts are of rugged construction. The dies are easily got at and may be readily adjusted when changing. The movements of the active dies minimize their periods of exposure to the hot metal, &c., and numerous other details have been handled in a way that appeals to experienced nut men. This is a high grade steady going tool capable of producing a full measure of work week after week.

The Norwalk Iron & Steel Company's plant at Norwalk, Ohio, is the pictorial subject of a souvenir postal card, the business men of the city having sufficient pride in the establishment of this enterprise to send out the card whenever opportunity affords. The company has just completed three brick structures in the way of additions—namely, an electric light plant, a water purifying plant and a new hammer shop, while 600 hp. has been added to the power plant. The electrical equipment has been doubled, a new charging machine for furnaces has been installed, several new annealing furnaces and crucible furnaces have been added, with other improvements, aggregating an expenditure of over \$100,000. The company is now operating with 275 hands, running day and night.

Bucket Trolley for Handling Granulated Slag.

The method of handling granulated slag at the Haselton, Ohio, furnaces of the Republic Iron & Steel Company is shown in the illustration, the equipment being that of the Browning Engineering Company, Cleveland, Ohio. Cinder disposal is one of the constant problems at the blast furnace and local conditions have much to do in deciding the means employed. With the primitive forking method, under which operating cost runs up rapidly as output increases, mules, carts, drivers and cinder snappers are required, and the ground area needed for the cinder bed enlarges as furnace output grows. At plants at which the next step has been taken, and the cinder run into pits of 3 or 4 ft. in diameter, jib cranes are employed to lift the masses of slag with tongs, after time has been allowed for cooling, and load them into cars. For a larger output an advantageous method makes use of the locomotive crane with a clam shell bucket to take cinder from a pit containing

signed to run over the slag pit and thence over a line of cars placed each day, having sufficient capacity to take the entire output of slag for 24 hours. This installation was successful, but was found to be capable of improvement.

The slag handling plant at Haselton, shown in the illustration, is the latest evolution of this system. The steel construction is rather more elaborate than is usual. A more economical form of runway may be used, with supports which do not rise above the trolley track, the necessary bracing being secured below the track. The Haselton plant has developed an economy in the handling of granulated furnace slag represented by a cost of less than 1 cent a ton. One man working in daylight time is able to load in the cars the output of a large furnace for the entire 24 hrs. The trolley frame consists of structural shapes, plates and castings, supported on four double flanged wheels. The hoisting and traveling mechanisms are arranged on the upper surface of the trolley frame and various shafts are so disposed that any one may be lifted out of its place without tak-



THE IRON AGE

Electric Bucket Trolley for Handling Granulated Slag at the Blast Furnaces of the Republic Iron & Steel Company, Haselton, Ohio.

water, doing it more economically than the jib crane. The locomotive crane also loads the cars and spots them as needed. Under this arrangement, besides the man on the crane, a man is required for coupling and switching cars. Yet another method employs an electric crane covering an area on which are parallel tracks. Cinder can be deposited at any point in this area with one operator, but the investment is large and would probably only be justified by special conditions.

The ladle car method, employed where there is abundant room for dumping liquid cinder, calls for a crew with locomotive and ladle car equipment. The investment is considerable and a crew of three men would ordinarily be necessary, while the repair account is relatively high. In some cases the distance to the dumping ground makes the element of time an important one.

As ground space has become more valuable and in many instances the surroundings of furnace plants have been built up, the granulation of the slag and its conveyance to other points for railroad ballasting, for filling and for road use becomes the only practicable method. The Browning Engineering Company first undertook to build an overhead traveling, bucket handling trolley for the Youngstown Steel Company. The trolley was de-

signed to run over the slag pit and thence over a line of cars placed each day, having sufficient capacity to take the entire output of slag for 24 hours. This installation was successful, but was found to be capable of improvement.

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The trolley traveling mechanism consists of a drum mounted on the trolley geared to a reversible motor. The wire ropes propelling the trolley are wound in opposite directions on the drum. A strap brake operated by a foot lever in the cab is supplied to the drum to stop the trolley quickly and hold it stationary at any desired

place. The grab bucket is of 2 cu. yd. capacity for work at furnaces having an output up to 400 tons a day. The spades of the bucket are perforated, so as to allow the water to run off as the bucket is hoisted out of the pit. The cost of operating one of these trolleys in the handling of granulated slag is estimated at \$2 a day for 50 hp., \$2.50 for one man's time, \$1.50 for investment and \$1.50 for depreciation and repairs. A cost of 1 cent per net ton for all items is thus arrived at where 750 tons of granulated slag are handled in a day.

One Link in a Good System.

To be able to follow the movement of stock from the time the raw material reaches the supply department until the finished product leaves the plant is of paramount importance to the manufacturer, as upon it depends the exact profit or loss of the particular job. Various schemes have been resorted to for keeping this record, many of which are quite complicated and involve considerable labor. The R. K. LeBlond Machine Tool Company, Cincinnati, Ohio, has devised a plan which seems to be perfect in detail and is at the same time easy of operation.

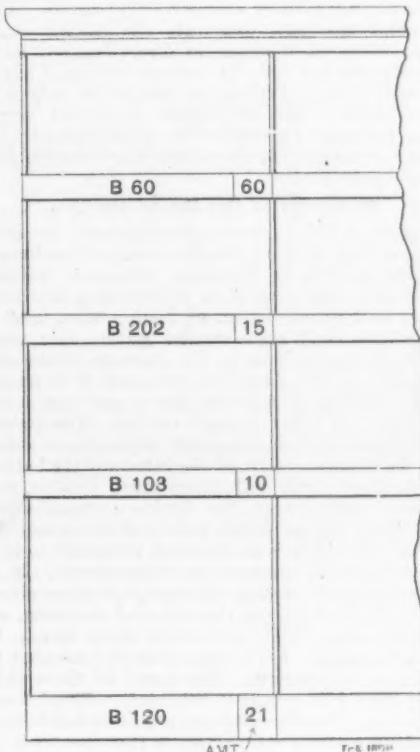


Fig. 1.—Front of Bin Used for Storing Small Castings by the R. K. Le Blond Machine Tool Company, Cincinnati.

Nason Pritchard, who has charge of this department, thus explains it:

All castings that can conveniently be put in bins are kept in that manner, while the large castings are kept on platforms. These bins are arranged in sections and may be of any length or width desired. Those in use at this plant, Fig. 1, are 9 ft. high, 15 ft. long and 2 ft. wide. On the bottom of each bin is a place to mark the amount, which must tally with the card in the office. As soon as castings are received from the foundry they are assorted according to symbol, counted, weighed and put in the bin, which also has a symbol number marked on it. A record of the amount is put in a book, with the name of the foundry from which the castings were received, to be checked against foundry orders and also to be entered on a card. No one is allowed to take castings from the stockroom without a written order, which is also used as a time card. As soon as the stockkeeper is notified that a lot of, say, 12-in. machines are to be run he makes out his foundry orders for the required amount of castings needed and at the same time his shop orders. These shop orders are then sent to the foreman of the stock-

room, who retains them until these castings are received. The foreman who has the first operation to perform is notified when castings are received and directs the stock-room foreman to place them. All shop orders are entered in a book and at the same time on the side of the card.

Fig. 2.—Card System Used in the Castings Stock Room of the R. K. Le Blond Machine Tool Company, Cincinnati.

shown in Fig. 2 designated "stockroom." Attached to each stock card is a stub, the exact duplicate of the large card, on which is filled the weight, and it is sent to the stockkeeper, who checks it in the stock order book and also places it in the out column on the "castings" side of the stock card. All these shop orders must be kept with the work until it is completed.

The Great Northern Ore Properties.

The Great Northern Railway Company has formulated a plan for handling its ore properties in the interests of its stockholders. This plan has just been made public through a circular letter from President James J. Hill to the stockholders, as follows:

Certain iron ore properties have been acquired and are now held for your benefit by the Lake Superior Company, Limited. The Board of Directors of your company, by resolution approved by the stockholders, has authorized and instructed the Lake Superior Company, Limited, to transfer the iron ore properties to Louis W. Hill, James N. Hill and Walter J. Hill, to be held by them in trust, and for the benefit of the stockholders of the Great Northern Railway Company, appearing as such of record at the close of business on December 6, 1906, and of their assigns.

The entire beneficial interest of the trust to be created will consist of 1,500,000 shares, and each stockholder of this company, of record on the date above named, will receive from the trustees a certificate for a number of shares of beneficial interest in said trust equal to the number of shares of stock of the Great Northern Railway Company held by him. The certificates issued by the trustees will be transferable upon their books in the same manner as stock certificates. The net proceeds and profits of the iron properties will, from time to time, and at least once in each year, be distributed by the trustees to the certificate holders of record at the date of distribution.

For the purpose of making the distribution of certificates, the transfer books of this company will be closed at 3 p.m. on December 6, 1906, and will be reopened at 10 o'clock a.m., December 8, 1906. On or about December 8, 1906, the trustees will issue, and deliver to the stockholders entitled thereto, temporary certificates for the number of shares of beneficiary interest to which each stockholder shall be so entitled. Upon the surrender of such temporary certificates to the trustees at their office, 32 Nassau street, New York, on or about January 15, 1907, certificates in permanent form will be issued in exchange therefor.

It will be observed that there is no capitalization, nor is there any operating, holding or other corporation, and no par or other valuation is placed upon the ore trust certificates. Criticism on the ground of over-capitalization has been avoided by making the certificates represent simply equal shares in a trust, of which the three initial trustees are sons of President Hill. No official statement as to the present earning power of the certificates has been made, but it is estimated that the receipts in 1907 on the ore taken out by the United States Steel Corporation will be \$1,237,500, and it is further estimated that about \$4,000,000 yearly is being earned from the operation of mines leased to parties other than the Steel Corporation.

Meeting of Naval Constructors.

Annual Convention of the Society of Naval Architects and Marine Engineers.

The fourteenth annual convention of the Society of Naval Architects and Marine Engineers held Thursday and Friday, November 22 and 23, at the headquarters of the American Society of Mechanical Engineers, 12 West Thirty-first street, New York, proved to be the most important meeting ever held by the organization. The sessions were attended by naval attachés from all parts of the world and the papers read were of unusual value. The society gave up considerable time to the discussion of power problems in connection with modern ships of war, and the papers covered about every topic of interest to naval constructors. An interesting feature of Thursday morning's session, which opened at 10 o'clock with F. T. Bowles, formerly chief constructor of the United States navy and president of the organization, in the chair, was his annual report in which he predicted that the coming year would see a new record in American shipping. Mr. Bowles laid particular stress on the fact that there is a great demand for vessels for the coast trade. He said in part:

The President's Address.

"During the current fiscal year vessels have been begun on the lakes, indicating even greater activity than last year, and orders have been given for vessels on the seaboard for the coast trade, indicating considerable demand for steel steam construction for that service and it is probable that the output of merchant vessels, almost wholly steam, for the year 1907, will exceed the greatest amount ever built in one year in the United States, namely 1855, when 583,450 tons were constructed. It is gratifying to be able to predict confidently that we in the United States shall not be much longer subject to the reproach that our tonnage in the foreign trade is less now than it was 100 years ago.

"During the last year American shipbuilders have undertaken the introduction of the coming motive power, turbine machinery. The first vessel for coast service equipped with turbine engines recently made its successful trial. The Navy Department has contracted for two scout vessels with turbine engines, and is apparently about to introduce turbine engines in battleships.

"American shipbuilders have reason to be proud of the navy vessels completed the past year. The number of first class vessels, battleships, and armored cruisers was exceptionally large, but the amount of new tonnage begun or authorized shows a great falling off. It is anticipated by members of our society that the developments in marine engineering during the past year will exercise a marked effect on new naval construction.

"While the Government's record of shipbuilding for the past fiscal year indicates a pitifully small showing of steel construction on the seaboard it is a gratification to the chair to be able to indicate a great improvement for the coming year and evidences of a more satisfactory showing for shipbuilding generally than has ever taken place in the life of this society."

The Society Flourishing.

After the president's address the society received the annual report of William J. Baxter, secretary-treasurer, in which Mr. Baxter stated that the organization's total resources were \$24,895.20, and that there were no liabilities. The total membership of the society at the time of the meeting numbered 857, divided into classes as follows: Full membership, 463; associates, 260; juniors, 121; life members, 5; life associates, 4; honorary members, 2; honorary associates, 2. The members re-elected Mr. Bowles as president and Mr. Baxter secretary-treasurer. W. L. Capps and D. W. Taylor, whose terms as vice-presidents will expire December 31, were re-elected for another term, and the following members were re-elected to the council: G. W. Dickie, W. B. Forbes, W. M. McFarland, Lewis Nixon, J. S. Hyde and J. W. Miller. The society also elected Arthur Fletcher and W. J. Baxter to the council in the places of E. P. Stratton and C. R. Hanscom, whose terms expired. A number of applica-

tions for membership were recommended by the council and acted upon favorably.

Thursday afternoon was given up to the reading of papers. At the close of Thursday's session a number of the members visited the new Engineering Building. Both the morning and afternoon sessions on Friday were given over to the reading of papers, and there was little time for discussions, although the society managed to get through a lengthy programme, of which details were given in *The Iron Age* for November 1. A paper on

Recent Developments in Armor and Armament

was read by John F. Meigs. Liberal extracts are given below:

The tendency in the past few years has been to increase the area of the sides of ships covered by armor and to increase the power of the guns. Armor has improved materially by the improvement of the hardness of its exterior face and also the toughness of its back, which latter quality resists cracking and disintegration; and at the same time the projectiles have improved by some betterment of shape and by hardening their front part and toughening their rear. This contest between the efficiency of armor and projectiles has been going on ever since the introduction of armor plate 50 years ago; and while it has been said from time to time that the projectile or the armor was ahead in the race for efficiency it is difficult to say exactly what has been the truth at one period or another, since the conditions are perhaps not always fully and correctly stated. The larger guns of ships can now penetrate the thicker armor used at 3000 or 4000 yd. distance in direct impact, but present armor is effective not only in keeping out shell but in keeping out special armor piercing projectiles whose internal capacity is very small and whose walls are very strong. It is said, on what appears to be good authority, that the thick armor of no ship in the recent war between Japan and Russia was perforated.

Features of the Dreadnought.

The most striking recent development in armor and armament is embodied in the battleship Dreadnought, laid down at Portsmouth in England. *Brassey's Annual* states that this ship's displacement is 18,000 tons, her horsepower 23,000, her belt armor 10 in. of Krupp steel, and that she carries 10 12-in. and some smaller guns. Her speed is 21 knots. She is supposed to be the outcome of the experience of the English in the Japanese war, and it is generally believed that their opportunities for experience were better than those of any other neutral nation. The principal departure in this ship as compared with others going before her is in the disappearance of the intermediate battery. She carries only 12-in. guns and others much smaller, and therefore returns tactically to the double turreted Monitor of our Civil War, a type which persisted for about 10 years. The smaller guns have been reported variously to be of from 3 to 4 in. caliber. If common report be correct, the Japanese are not laying down a ship of quite the same class. Their most recent battleships are the Aki and Satsuma, of 19,000 tons displacement, which will carry four 12-in., 12 10-in. and 12 4.7-in. guns. They also carry five torpedo tubes, of which four are submerged. The speed of these ships is 19 knots, and their belt armor is reported to be of from 9 to 5 in. in thickness. The French have laid down battleships armed in a very similar way, and our reply in this country is to change the battleships Michigan and South Carolina so that their batteries, instead of being like that of the Connecticut, are to consist of eight 12-in. guns. It is interesting here to note that the London *Engineer* of July 30 last, in commenting in its principal leading article upon the fact that the British Admiralty has determined to lay down a less number of Dreadnoughts than originally planned, states that there are dissenting views as to the Dreadnought type in the British Board of Admiralty. The *Engineer* also acknowledges that there is some doubt in its own view whether the original Dreadnought should have been laid down.

An Increase in Guns and Armor.

The growth in the direction of using a large number of guns of heavy caliber has been going on for years. We laid down in this country about 15 years ago the Oregon class, but this type was not introduced nor followed in Europe until the vessels of the Regina Elena class of 12,000 tons were laid down in Italy. These vessels carry two 12-in., 12 8-in. and 12 3-in. guns. Their belts are 9½ in. thick and their speed is 22 knots. They were launched in 1904-1905 and are unquestionably remarkable vessels, but are much less remarkable than was the Oregon in her day.

The increase in the size of ships laid down in England and Japan since the Japanese war is not very great, since the Lord Nelson, laid down in England in 1904, is of 16,500 tons and carries four 12-in. and 10 9.2-in. guns; and in this country the Connecticut class, just completed, are of 16,000 tons displacement and carry four 12-in., eight 8-in., 12 7-in. and 20 3-in. guns. The speed of these latter ships is 18.8 knots and they have four submerged torpedo tubes.

Possibly the growth in size of ships in general, which

has been going on ever since ships were first built to go to sea, has as much to do with this movement as anything else, and, as is well known, even these larger and more recent battleships are far below the great merchant liners in displacement. With this growth in size comes naturally an increase in the thickness of armor and of the area covered by it, followed by a necessary increase in the caliber of the guns carried. It is stated often that the large guns are more accurate than small guns, and that they alone can be relied upon, because of their maintenance of velocity over long ranges, to pierce armor, and that therefore battleships must carry large guns only. This view is the correct one only if it be true that large guns in circumstances of service are better hitters than small ones, and if it be true that the resistance of ships cannot be overcome by smaller guns. It has been contended that the way to beat your enemy was to be able to hold him at long range and destroy him while he cannot reach you; and from the fear of this, as much as from anything else, long range guns have been put into ships. While not denying the value of long range guns in certain circumstances, it should be noted that all decisive naval actions have been fought within point blank range. This is the range within which guns do not need to know the distance of the target. The trajectory is so flat that the target will be hit anywhere in the length of the range. For a 12-in. gun with about 2650 ft. velocity, with a ship whose side is 20 ft. high, this range is about 2000 yd., and for a 6-in. gun at 3000 ft. velocity it is about the same.

It has usually happened in the past that ships successful in battle have owed their success to their overcoming the personnel of their enemy, rather than to sinking their ships. The ship's motive power was destroyed in days gone by by the destruction of the masts and sails, and is now destroyed by the perforation and destruction of funnels and other exposed parts. They also now become unmanageable, as formerly, because their steering and signaling stations are rendered untenable and because they are set on fire in many places. The bursting of a 12-in. shell in a comparatively large casemate would perhaps be no more serious than the bursting there of a 6-in. shell. They would both destroy all life and any guns or other material at the point. If the 12-in. shell passes out on the far side of the ship without bursting it does perhaps no more harm than the 6-in. shell, and its margin of time in which to burst is only about one-fortieth second. In other words, it is very likely that a shell will pass out on the far side. We have delayed action fuses, intended to secure the bursting of shells within the sides of a ship, but the exact time of delay varies as between the penetration of a 1-in. and a 10-in. plate, say, and, further, is not accurately known or entirely controllable.

DISPOSAL OF GUNS IN TURRETS.

The bringing forward of the heavy calibers of guns has led to placing numerous circular or nearly circular turrets in ships, in which the guns are usually mounted in pairs. We have in this country, as is well known, many cases of four guns being yoked together in the double turrets, and in France particularly many ships have been built in which guns are placed singly in turrets; but as a rule they are mounted in pairs. There are many things to be said in favor of guns so mounted, but as they are now disposed they absorb a great deal of the displacement of a ship for armoring them; and the complexity of the mechanism, situated in a very confined space, is by many persons thought to be of great danger. The recoiling weight of a 12-in. 45-caliber gun is something over 60 tons, and when the gun is fired it starts to the rear at a velocity of 26 and 28 ft. per second, or 18 to 20 miles per hour. It is checked by a hydraulic cylinder in about 35 inches, and it is interesting to note that this is equivalent to stopping two Pullman sleepers at the speed stated in about 3 ft. The weight of the turret armor and turret structure and guns, which is the weight available to absorb this enormous force, is about 450 tons. The turret is held down to the barbette on which it is mounted by massive clips and by cone rollers having flanges, but in these turning parts there must be clearances; and, as stated, the weight available to smother the blow of a gun is only about 450 tons. The whole weight of two 12-in. 45-caliber guns, with their mounts, turrets and barbettes, the latter being the fixed cylinder in a ship which protects the lower part of the turret machinery, is about 800 tons.

THE MONITOR TYPE RECURRING.

It would seem from the above that the last word in naval construction, so far as armor and armament is concerned, does not regard an increase of displacement so much as the doing away with the intermediate batteries; a reversion to the Monitor type pure and simple, with the exception that the freeboard and the speed are greater. In her day the Monitor was a most extraordinary vessel. She was tactically equal all around. She did not care at what angle she presented herself, as her offensive and defensive powers were equal at all angles, and she was impenetrable to her own fire, on account of relative power of her defense as compared with her offense, at very small ranges. The last battleships, carrying in four or five turrets pairs of

12-in. guns, are in many respects similar. The Monitor came and went, and now there is an appearance that we shall have a recurrence of this type. Any one who has visited the arsenals of Europe or has examined the old guns which may be seen at various points must become aware how the fashion in guns has recurred. Two hundred years ago guns were of small bore and were approximately cylindrical in internal shape, and their charges were large compared with the weight of their projectiles. The guns then began to shrink in length and obtained a minimum length at the time of our Civil War, when the type known as the soda water bottle type was in vogue. Guns were short with large breech ends, and small charges of quick burning powder were used in them. If ships or armies differently armed should meet, the one that can force the other to fight her battle should win. If a ship has long range guns and wants to maintain the great distance she must have speed. If her guns are short range and she has speed, she can approach her adversary and neutralize his advantage in long range guns. This simplicity, it should be noted, does not hold in fleet actions, since the motion of fleets is much more complicated, and since, if it be decided to fight a decisive action, the matter of bringing the enemy within a distance which will render the action decisive becomes of predominant importance.

THE SHAPE OF GUNS.

The question of the shape of guns is of great importance in other ways besides those of a tactical nature, it being well known that, especially the large calibers guns now in use, having from 2800 to 3000 f. s. velocity with high pressures, have very short lives—that they cannot be fired many times without so great degradation of their bore as to impair their efficiency. This is caused by the flow of the very hot powder gas along the bore, and a 12-in. gun will be subjected to this flow, when the guns are similar and other things the same, twice as long as a 6-in. gun. This means that the 12-in. gun will be spoiled in less than half the number of shots that will spoil the 6-in. gun. It is a very serious question when the great difficulty of replacing guns in ships, even if the new ones are entirely ready, is considered. We never hear of a military hand rifle being adopted for service without the public statement and discussion of its life—the number of times it can be fired without substantial degradation. The above leads naturally to the inquiry into the life of 12-in. guns and others of smaller caliber. If the life of the guns is too short the way to remedy it is to use, while maintaining the weight of the gun, one of larger bore using a larger projectile and a less pressure, and, of course, less highly heated gas. In such a gun the velocity of the projectile would be lowered with the pressure and temperature of the gas, unless the gun's length were greater. For example, as between an 18-in. and a 12-in. 55-ton gun of about the same total length, the temperature of the powder gas in the 18-in. gun would be about 30 per cent, lower than in the 12-in. gun when using full power. If guns are to have the same life—that is, if they are to be capable of being fired the same number of times in all—the pressures and temperatures in large guns must be kept below what they are in smaller ones. This is a universal and self-evident law, perhaps not always appreciated and not usually acted on, since the pressures in all guns are about the same. Present practice can be justified only upon the assumption that large guns are to be fired less often than small ones.

"CONTINUOUS AIM" DEVICES.

An arrangement of turret mount for 12-in. guns has been brought forward lately by the Bethlehem Steel Company, in which the rammer moves with the gun as it swings in elevation, keeping on the target while the ship rolls from side to side. Thus can be realized in turret mounts, the same as in ordinary broadside guns, what is called "continuous aim." In "continuous aim" the gun's sights are kept always on the target and the gun fired when ready, the loading operations going on while the gun swings about following the target. This increase in convenience and efficiency which is continually going forward is interesting.

The author here sketched in some detail the changes introduced since the régime under which turret guns had to go to a fixed position in both azimuth and elevation to be loaded.

Much has been done in late years in the way of throwing the broadside guns more entirely in the hands of the men using them, and it has been customary to drive the gun's vertical motion, or its elevation, as it is called, by a man on the left of the gun, and its training, or motion in azimuth, by one on the right. These men look through two telescopic sights rigidly locked together and moving at all times in unison. A 6-in. gun and mount built by the Bethlehem Steel Company were shown, with which a considerably increased rate of hitting has been realized and with which very good targets have been made with a simulated rolling motion up to 10 degrees. Records were given of shots fired at vertically moving targets whose motion and speed simulated the change in angular position of a ship's gun with respect to a target if the ship were rolling.

Little Change in Armor.

As respects armor, there has been no marked development now for some years, and armor still consists of a very hard cemented face introduced by Harvey in this country, with the improvement in the tough back introduced later on by Krupp. There is greater uniformity in the armor and a betterment in detail, but no marked change or departure. Projectiles continue to be capped, and this improvement is thought to be equivalent to adding from 10 to 15 per cent. to their velocity. Armor is much undervalued ordinarily, it being, on account of the great severity of its treatment on the proving ground, held to be below its real value. It is said that no thick armor was perforated in the recent war between Japan and Russia. This is due largely, of course, to the immense preponderance of glancing blows. An officer who served in a Russian ship during the battle of Tsushima told me that he ascribed their defeat to the fact that they were using armor piercing projectiles and the Japanese were using cast iron projectiles. The latter burst whenever they struck anything at all and the pieces flew everywhere in showers; whereas the armor piercing shells rarely or never burst, it being difficult to burst armor piercing shells without very good fuses.

As respects torpedoes, their range has been very much increased of late, and it is now claimed that they will do effective work at 3500 to 4000 yd. range. This increase has been reached largely by the introduction of turbine engines. The practice, at one time abandoned in this country, of putting torpedo tubes in battleships and large cruisers, appears to be continued, although it is stated that no torpedoes were fired from ship's tubes during the Japanese war.

Submarines have realized substantial successes in recent years, and it is said that 40 or 50 of them are built or building in England. Their speed on the surface is as high as 12 or 13 knots and somewhat less below the surface, and it is said that the English Government has spent to date nearly \$10,000,000 on them, and intends to use them in harbors in place of the dormant mines formerly contemplated to be used. It is recognized, however, in this country and in England that their use must be confined, for the present at least, to such a field as this and that they cannot be used with the active sea going fleet.

Private Ordnance Works.

A development of great importance in armament has grown up in this country within the last few years in the equipment of private ordnance factories. Only by means of these, probably, can a sufficient volume of ordnance output be reached. None of the great military powers rely entirely on their own shops for ordnance, and it would appear that the best way to get a full and elastic source of supply is to go to the trade, for if large manufacturing concerns maintain a sufficient ordnance staff, both in their offices and shops, they can quickly enlarge these and meet any demand that may be made. The question of the available sources of supply in this country, which at the outset of the up-building of the navy attracted much attention, is not much considered at present. It is very much below that of all the great European powers, and while any war must probably be fought with the larger guns on hand at its commencement, the number of smaller guns required, the repairs necessary to be made and the ammunition that would be called for would be very great. For this reason the question of the available sources of supply is a vital one.

The Gas Engine for Modern Vessels.

In his paper on "Explosive Engines for Naval Purposes," Arthur T. Chester presented the claims of the gas engine to consideration as a competitor of steam power on modern vessels. In a comparison of the efficiency of the two powers on war vessels he considered particularly radius of action and fighting ability. Radius of action depends upon the efficiency of the propelling plant, the quantity of fuel carried and the quantity of fuel expended in getting under way, coming to anchor and while lying prepared to get under way on short notice. An explosive engine connected with a gas producer can generate 1 hp. on from 0.8 to 1 lb. of coal. It is a very efficient marine steam engine that can generate a horsepower on from 2 to 2.5 lb. Thus an explosive plant will carry a vessel two and a half times as far as a steam plant. Allowing 100 lb. for the weight of machinery and producers to each horsepower generated by a gas engine there is a saving of 50 lb. per horsepower over steam. This saving will permit a corresponding increase in fuel capacity. When a gas engine is not in operation the fires in the producers simply smolder, consuming very little coal in a day. The necessary expenditure of coal in bringing steam up to the working pressure, in letting fires die down when coming to anchor, and in holding them in readiness by banking, is eliminated in a gas engine plant.

The question of comparative fighting ability was discussed under seven heads, in substance as follows: 1. A gas plant can be operated by half the men now required in the engineer's force of a man-of-war, and such saving in men permits a corresponding increase in the deck or fighting force. 2. The direct saving in weight of machinery and boilers can be used to increase the weight of armor and armament. 3. A vessel equipped with a gas engine is ready to get under way on an instant's notice, and while cruising it is possible to attain maximum speed by simply opening the throttle. 4. With a gas engine the throttle and spark control the speed, and as the latter can be set for the approximate speed it would be easy to put the control of the throttle in the hands of the officer of the deck on the bridge. Control in the case of steam power means a continuous series of orders from the bridge to the fireroom. 5. With an intricate system of boilers and pipes every inch of it must be capable of withstanding the maximum pressure. Accidents from broken pipes or joints or bursting boilers are obviated where gas engines are used. No pressure is used in the producers and connecting pipe, and should one of these be penetrated the engine simply stops, and on the cutting out of the individual producer or the opening up of an auxiliary pipe the engine may be started again. 6. A vessel is usually discovered first by her smoke. There is no smoke to a producer. A torpedo attack can become a failure, due to the glare from one stack, which is a hard matter to prevent when under forced draft. 7. While the explosive engine has not the reputation of being reliable its construction has improved very greatly in the past few years. A gas engine requires no more care and attention than a steam engine, and with the former all the time, labor and expense required to keep a modern water tube boiler in condition are eliminated.

The Future of the Gas Engine.

The writer expressed the opinion that the coming power generator for all purposes is the gas engine, either reciprocating or turbine. While the gas engines on the market to-day do not run much above 300 hp. in marine engines, the writer believes that if the problem of taking care of the heat can be eliminated the question of building marine engines of large powers becomes a simple one. In an engine having a 6-in. bore and 6-in. stroke there is 22.23 sq. in. of radiating surface for each cubic inch of gas. By doubling these dimensions the proportion of radiating surface is reduced to 11.24. The greatest difficulty is found with the piston. With the usual design this cannot readily be water cooled. By using a double end cylinder the rigid connection between piston and hollow piston rod permits of a free circulation of water through the piston rod to the piston and back through a tube inside the former. If the surfaces exposed to the high temperature of explosion can be sufficiently cooled to permit of practical working there is a great advantage in using large instead of small dimensions, for with the reduction of the proportion of area to volume the percentage of loss due to radiation is reduced, and as this source of loss accounts for from 30 to 40 per cent. of the heat units not turned into actual work it is a matter of great importance.

The Best Type for Large Marine Engines.

The writer took exception to the view that the two-cycle double-ended engine is most advantageous for large marine producer engines. He stated four objections:

1. The simplicity on account of absence of valves is in a large degree counterbalanced by the necessity of installing a pumping system to force the gases into the cylinders.
2. No two-cycle engines have approached the economical results obtained in a four-cycle engine.
3. This construction requires a piston equal to the length of the stroke, which increases the height of the engine.
4. The difficulties encountered in cooling the cylinder walls and piston are very much increased in the two-cycle engine, as the explosions occur twice as often.

It is the writer's belief that the lines upon which a high powered marine engine should be designed are as follows:

1. The engine should be double acting, four cycle and vertical.

2. Piston, piston rod, valves, cylinder walls and exhaust pipes should be water cooled.

3. Some means should be devised to keep the temperature of circulating water within a few degrees of the highest point at which it will effectively cool the engine.

4. The bore and stroke should be about equal.

5. The complication involved in the installation of auxiliary exhaust valves should be omitted unless found to be absolutely indispensable.

The paper then discussed the relation of the gas engine to the equipping of men-of-war with sea going torpedo boats. Such boats with steam propelling plants were found too heavy to carry on board ship, as they could not be hoisted by a ship's crane and were barely able to make 12 knots. The advent of the gas engine has made the small torpedo boat practical and permits of a working boat capable of filling all the conditions required of it. The construction of such boats was considered at some length, and the author outlined a design he favored, also a method of carrying and discharging a torpedo, the whole being based on the employment of explosive engines.

Probably the greatest opposition to the introduction of explosive engines in the navy has been due to a prejudice against the carrying of gasoline. While the writer believes that with proper arrangement for carrying this oil and a thorough knowledge of its characteristics the danger of accidents would be reduced to a very small factor, the practicability of using alcohol has eliminated that small risk. One of the most attractive features about alcohol is that it has a great affinity for water. A slight leak in the tank or pipes would be dangerous with gasoline, while alcohol would mix with the bilge water and destroy its explosive qualities. The use of alcohol as a fuel for explosive engines only requires a slight increase in compression and possibly in the admission port opening, and a specially designed carbureter.

The Type of Engine for Naval Purposes.

One of the most important things to be considered is the selection of an engine for naval purposes. While weight is an important factor it is not the only point to be considered. With a given bore and stroke and a proper design the only way to decrease the weight per horsepower is to increase the compression and piston speed or cut down the material used, allowing small factor of safety. While such a design is practical for a high speed motor boat where time enough elapses between runs to keep the engine tuned up to its full power, it is not practical for an engine requiring constant and hard service as it would receive in the navy.

An engine for that purpose should have a large factor of safety in all its construction, with a comparatively low compression and piston speed. It should have as simple and as accessible a design as possible. Valves should be interchangeable and arranged so as to be removable without taking off the cylinder head. Cylinders should be cast separate, insuring large main bearings and a unit construction permitting the removal of one without affecting the others. In conclusion, the author says: "Many will differ with the writer in a number of the foregoing statements and opinions, but few of those who have seen the rapid advancement of the explosive engine and studied its many advantages, can deny that it is only a question of time before steam will be supplanted by the gas engine just as the once universal sail power has been dropped in favor of steam, never again to be considered one of the world's great power generators."

On Friday night about 150 members and guests sat down to a banquet at Delmonico's, and after the repast listened to an address by Secretary of the Navy Charles J. Bonaparte. Mr. Bonaparte expressed the belief that the country should have a bigger navy, although he had stated in his last annual report that if the navy maintained the strength it then had actually or in prospect it ought to be sufficient for all contingencies that might arise. He said that in his forthcoming report he would take that statement back. "I believe," he continued, "that it is a wise economy for our Government to promote that form of our naval strength involved in the enlargement of our merchant marine, which will enable us to second the navy in time of exigency and take the

place of certain elements of naval strength which might otherwise be provided for in the navy itself." There were informal speeches by Admiral J. B. Coghlan, commandant of the Brooklyn Navy Yard, Lewis Nixon and Congressman Loudenschlager.

San Francisco Enjoying Good Trade.

SAN FRANCISCO, November 19, 1906.—General trade is good. The upbuilding of the city, next to the lumber trade, gives rise to sales of unprecedented magnitude by our hardware and machinery houses. The returns of the clearing house are beyond all comparison. This comes principally from the southern Nevada mining excitement, the greatest ever seen here. These mines will require a vast quantity of machinery.

We are making haste slowly in getting down to the reconstruction of the steel and cement buildings of this new city, but we are making progress. There have been contracts for about a dozen new steel and concrete buildings and a great many more tall structures with a minimum of iron or steel. Few of these have yet started, as there have been difficulties of one kind or another in the way, but repair of those that were injured by the earthquake or fire is progressing slowly. Most of them were injured more seriously than at first supposed, but the injury was in nearly all cases to the brick or stone or cement walls and not to the steel frame. San Francisco is being hurriedly built up, mainly of wood, brick and cement, but when these come to be replaced by finer and taller buildings steel will be the principal material that will enter into their construction. There will thus be a great market in this city for the next 20 years for structural steel, partly of Eastern and foreign manufacture, possibly partly of California origin. A local engineer has been experimenting for some time with the application of petroleum to the reduction of iron ore and it is stated that he has been successful. At least he shows a large steel ingot that he claims is the result of the new process. He is continuing his experiments with the view to the production of merchantable steel in as large masses as may be desirable. When he can prove undoubted success the capitalists who are backing him will erect a steel plant on some part of the southern California coast. As to raw material, there are said to be unlimited deposits of the finest kind of ore, fully equal, to say the least, to the best Lake Superior, in Madera County, covering the country in which are the hills or foothills called the Minarets. Most of the sections that are ore bearing were claimed a couple of years ago by ex-Attorney-General Hart of this State, but are now controlled by Mrs. Hetty Green, the famous woman capitalist. Besides, there are the noted ores of Shasta and other Northern counties, which would have been exploited years ago but from the fact that the work was too expensive, and the ore from which the Clipper Gap pig iron was made, which was sold in this market for three or four years and was of a very superior quality, but it cost too much to lay down here. Times have changed since then, however, and fuel oil and cheap transportation may overcome the old obstacles.

J. O. L.

At a meeting of the stockholders of the Diamond State Steel Company, at Philadelphia last week, the following committee was appointed to consider plans for the rehabilitation of the company: H. T. Wallace, president; J. S. Arndt, George Kessler, G. V. Heberton, A. G. Formuth, D. J. Driscoll, Joseph Netter, James A. Longstreet and T. F. Nellus. To create a trust fund, thereby providing for necessary expenses of protecting stockholders' interests, a resolution was passed recommending the payment of 5 cents a share by preferred and common shareholders.

The Secretary of State of Indiana in his report to the General Assembly recommends the amendment of the laws, so that corporations will be compelled to make annual reports to the State concerning the amount of

capital stock, increase or decrease; officers and directors, changes of name or location, amendments to charter, &c.

Shipbuilding in 1906.

Annual Report of the Commissioner of Navigation.

WASHINGTON, D. C., November 27, 1906.—The forthcoming annual report of Commissioner of Navigation Chamberlain reflects a most gratifying revival in the shipbuilding industry, especially in steel construction. In the past fiscal year no less than 1221 vessels of 418,745 gross tons were built and documented in the United States, compared with 1102 vessels of 330,316 gross tons for the previous year. From advance figures secured by the Commissioner for the current fiscal year it is probable that the total output of all the yards will exceed 500,000 gross tons, a figure that has never been equaled in the past half century.

Statistics for the Year.

The construction during the fiscal year ended June 30, 1906, classified geographically and by power and material, is shown in the following table:

	1905.		1906.	
	No.	Gross tons.	No.	Gross tons.
Atlantic and Gulf coasts.	661	210,601	653	126,622
Pacific coast.....	162	20,115	197	20,261
Northern lakes.....	101	93,123	204	265,271
Western rivers.....	178	6,477	167	6,591
Totals.....	1,102	330,316	1,221	418,745
Power and Material.				
Sail:				
Wood	305	76,193	225	32,182
Steel	5	3,225	4	3,077
Steam:				
Wood	492	27,398	550	26,613
Iron and steel.....	68	170,304	100	289,094
Canal boats.....	30	3,248	83	8,832
Barges:				
Wood	186	40,837	248	53,798
Steel	16	9,111	11	5,199
Totals.....	1,102	330,316	1,221	418,745

Construction During the Current Fiscal Year.

Unless strikes, delays in furnishing structural steel, or other unforeseen difficulties prevent the output of steel merchant vessels during the current fiscal year will be greater than ever before in this country, and it is possible that the total tonnage of all types of vessels for the year will reach 500,000 gross tons, the largest tonnage built since 1855. The new tonnage numbered during the quarter ended September 30 is greater than for the corresponding quarter in any year since 1894, when the present form of quarterly statement was first adopted. Work in progress is more evenly distributed among the shipyards of the seaboard and of the Great Lakes than for some years, and the signs point to a successful year for the American shipbuilding industry. From these statements, however, it cannot be inferred that any direct progress toward American participation in the foreign trade is indicated. Of all the merchant steamers on July 1 under contract or construction only two, the Saratoga and Havana, each of 6400 gross tons, will engage in the foreign trade, and these two will operate under the ocean mail act of 1891, taking in part the place of steamships bought by the Government for its line to the Isthmus of Panama.

In accord with the custom of the Bureau of Navigation for some years American builders of steel vessels were requested to make a return showing the steel merchant vessels under contract or under construction at their respective establishments at the beginning of the current fiscal year. The Navy Department, the Revenue Cutter Service, the Lighthouse Board and other branches of the Government engaged in operating vessels for public purposes were requested to furnish a similar statement of vessels building or under contract in private yards for their service on that date. Following is a summary of this interesting information:

SEACOAST. Merchant and Government.

	Merchant vessels.	Government vessels.	No. Tonnage.	No. Tonnage.
Newport News Shipbuilding & Dry Dock Company, Newport News, Va.	3	45,000	11,575	3
William Cramp & Sons Ship & Engine Building Company, Philadelphia, Pa.	8	40,500	37,700	3
New York Shipbuilding Company, Camden, N. J.	7	46,500	18,600	1
Harlan & Hollingsworth Corporation, Wilmington, Del.	13	800	10,880	
Fore River Shipbuilding Company, Quincy, Mass.	5	23,500	18,000	7
Union Iron Works, San Francisco, Cal.	4	37,000	24,600	3
T. S. Marvel & Co., Newburgh, N. Y.	2	175	3,000	1
The Moran Company (Mcran Brothers), Seattle, Wash.	1	14,948	1,564	1
Totals.....	43	208,483	125,919	22

Merchant Only.

Maryland Steel Company, Sparrows Point, Md.	8	7,732	..	....
Burlee Drydock Company, Port Richmond, N. Y.	17	6,388	..	....
Delaware River Iron Shipbuilding & Engine Works, Chester, Pa.	5	17,650	..	....
William Skinner & Sons, Baltimore, Md.	2	409	..	....
Merrill-Stevens Engineering Company, Jacksonville, Fla.	2	1,026	..	....
The George Lawley & Son Corporation, South Boston, Mass.	1	175	..	....
Totals.....	35	33,380	..	....

Government Only.

Bath Iron Works, Bath, Me.	2	18,698	..	....
Neafie & Levy, Philadelphia, Pa.	1	9,700	..	....
Pusey & Jones Company, Wilmington, Del.	4	933	..	....
Totals.....	7	29,331	..	....

GREAT LAKES AND WESTERN RIVERS.

Chicago Shipbuilding Company, Chicago, Ill.	2	14,661	..	....
Dubuque Boat & Boiler Works, Dubuque, Iowa.	1	1,100	..	....
Johnson Bros., Ferrysburg, Mich.	3	17,000	..	....
Superior Shipbuilding Company, West Superior, Wis.	1	7,000	..	....
Detroit Shipbuilding Company, Detroit, Mich.	6	29,710	..	....
American Shipbuilding Company, Cleveland, Ohio.	5	27,304	..	....
American Shipbuilding Company, Lorain, Ohio.	7	45,405	..	....
American Shipbuilding Company, West Bay City, Mich.	5	32,800	..	....
Totals.....	33	175,472	..	....

On July 1, 1905, only seven ocean steamships of 1000 gross tons or upward, aggregating 38,000 tons, were under contract or construction. On July 1, 1906, 32 such ocean steamships, aggregating 132,000 gross tons, were similarly reported. While some of these are now in operation, others will not, for various reasons, be finished by the end of the current fiscal year. So many steel ocean steamers, however, have never before been under contract in the United States as at the present time.

The large share of warship construction in the work of our shipyards has been shown in terms of tonnage in the Bureau's reports for several years. The following table, obtained by courtesy of the Director of the Census, shows in the more generally understood terms of money, the value of war ships and merchant ships launched in the United States during the calendar year 1904:

	Aggregate.	Private vessels.	Private yards.	Government yards.
Total number..	2,281	2,197	53	31
Tonnage	429,856	528,599	174,005	27,252
Value	\$79,926,510	\$31,181,067	\$42,298,434	\$6,447,000

Of the total value, \$79,926,510, of launched vessels, \$48,745,443 was in Government vessels, appropriated for by Congress. Contract price is taken as value. It requires much more time to build war ships than to build merchant vessels. While less of the value of Government vessels was actually paid out during 1904 than of the value of merchant vessels, the naval programme is evidently the foundation of the steel shipbuilding industry on the seaboard.

The first large American merchant steamer in which

steam will be applied according to the turbine principle, the Governor Cobb, 2,522 gross tons, was officially numbered on October 4. Thus at home and abroad the calendar year 1906 may be accepted as the date in the history of merchant shipping of the definite adoption of the turbine principle.

W. L. C.

Slower Ore Shipments Worry Consumers.

DULUTH, MINN., November 24, 1906.—The difficulty of shipping iron ore out of Lake Superior the past two weeks has been far more serious than Eastern receivers and consumers have appreciated, as is evidenced by the letters and frantic messages which shippers here have been receiving recently. It is also very evident that many consumers are in far worse shape as to stocks for the winter than had been believed possible. Not a few of them have stated that if their last cargoes were not delivered they would be unable to continue furnace operations till spring. And this, in some instances at least, is said to be no idle fear.

Night after night the past week or two the mercury at all points along the Mesaba has gone down to 9 to 12 degrees above zero. This is enough to thicken ore on the surface, and to freeze it so tightly to the sides and bottoms of steel ore cars that it is an exceedingly difficult operation to poke it through into dock pockets, and not only difficult, but very slow.

The method of ore handling just now differs materially from that of the warmer season. In the first place it is not loaded into cars at the mine until there is positive assurance that the ship to receive it is at ore docks—not that she has passed the Sault and is due at Duluth or Two Harbors at a certain hour. This was the customary procedure heretofore, but experience last fall taught the railroad companies that nothing can be depended on along Lake Superior in the late autumn. As soon as the ship is safely at port word is sent to the mine, the train is loaded as rapidly as possible, hauled over the road to dock with utmost speed and dumped directly through the ore pockets into the vessel; no pockets are permitted to be filled, and there is, therefore, no storage in reserve. It is frequently necessary to steam the ore to get it out of the cars. The Duluth & Iron Range Railroad last fall built a steaming shed to handle 80 cars at a time, which was quite an advance over former methods of steaming with locomotives. Once in the hold of a ship the ore is safe, for the water outside the steel sides is not below freezing point and prevents the ore from thickening. This all means that shipments are much impeded, and that costs are materially increased.

The Duluth, Missabe & Northern Railroad is shipping at the rate of 25,000 tons per day, which, while it would have been considered very good for mid-season two years ago, is a rather poor record now. But the congestion of shipping in port a week ago has been diminished, so there are now not half the 250,000 tons of vessel room waiting cargoes that were here early this week. If the weather does not materially improve almost at once the season is practically over, and further shipments will be carried on so slowly and at such costs that any further material increase of tonnage is out of the question.

The Fabulous Canadian Ore Discovery.

Statements of the discovery of a great iron district a few miles east of Port Arthur, on the north shore of Lake Superior, and of the connection therewith of the Atikokan Iron Company of that city have been published. It is stated that test pits have uncovered an amount of ore estimated at 200,000,000 tons of good quality. Such stories are absurd and exaggerated beyond all bounds. Some ore has been found in that immediate neighborhood in the past two years, and the developments have frequently been referred to in this correspondence, but there is not yet any considerable quantity of good ore, and the future of the district is still much of a question. It may, perhaps, prove up with sufficient work, but the general opinion is adverse. The Atikokan Iron Company's ore operations are chiefly confined to the Atikokan range, 120 miles west of Port Arthur, where it owns a mine, but

it has done little or nothing there yet, waiting for its furnace at Port Arthur to be completed and for a railroad to the ore deposits. Some Canadian development is under way on the east side of Nepigon River and Lake, where excellent indications were discovered some years ago. The United States Steel Corporation is understood to be operating there this winter, and some independent workers are in the district. One of these is reported in the newspapers to have made an important find recently. But the probability is that little news of this work will come out before next spring, for the region is so remote and inaccessible that few men will go in or out during the winter months.

Exploration and Development Operations

on the Menominee range, that have been very active all summer, are still as lively as ever. At one point, the Welsh, at Commonwealth, Oglebay, Norton & Co. have ceased explorations, but are still busy at the Buckeye, where they made a small shipment of ore this year, and will try to develop a large mine. On the Welsh an excellent vein was cut, but on further development it pinched out. This firm has let a contract to the Sullivan Machinery Company for a large amount of diamond drilling on the Pfister Land Company properties in the Michigamme Valley, which it has secured. These lands have been partially explored with rather encouraging results, though no ore has been found on them. In their Seldon property, at Stambaugh, Oglebay, Norton & Co. have made a very good find. They have been exploring there a year, and have now cut a body of excellent blue hematite ore that seems wide and persistent on exploration so far carried out. The work will be pushed with greater speed.

Lands on the Western Gogebic, near Mellen, that have been idle for many years, are to be explored. The Gogebic formation is very strong at that end of the range, but the character of the deposits seems to be changed and merchantable ore has not been found there as yet, although much exploration has been carried on there from time to time for the past 25 years. The lands now under exploration are those known as the Hoppenyan tract, and the Montreal Mining Company is back of the drilling. Gogebic mines are nearly through their operations for the year, and some of them are stocking ore at the present time. All stocks from last winter have been disposed of.

New stripping projects for the Mesaba are under consideration by several interests, notably the Oliver Iron Mining Company. There will be a large new pit, composed of several mines, around Virginia, and another at Eveleth, while the work that has been underway at Hibbing and vicinity, in two or three groups, will be extended and continued indefinitely. It is safe to assert that more dirt will be moved from over ore on the Mesaba range in the next five years than in all the previous history of the range.

D. E. W.

Evening Technical Courses at Columbia University.

—The Board of Extension Teaching of Columbia University, New York, announces a series of nine evening technical courses, beginning December 3 and lasting 20 weeks. The courses are under the immediate direction of Prof. Walter Rautenstrauch of the Faculty of Applied Science, and are to be given by professors and instructors of the university and other persons especially qualified. Moderate fees are charged, and most of the courses are for two evenings a week. The courses comprise Engineering Physics, Elementary Mathematics, Drafting, Strength of Materials, Machine Design, Structural Design, Electrical Engineering, Steam Engineering and Special Engineering Problems. The courses will be given in the buildings of Teachers' College, Columbia University, at West 120th street and Broadway, which affords necessary lecture rooms, laboratories, drafting rooms, &c. A complete catalogue of the courses can be had by addressing Evening Technical Courses, Extension Teaching, Columbia University.

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A party of 35 students from the engineering department of the University of Illinois visited Milwaukee, Wis., November 21, for the purpose of making a tour of inspection of the Allis-Chalmers Company's plant.

A New Sea Anchor for Coaling at Sea.*

BY SPENCER MILLER.

This paper records certain experiments and conclusions regarding sea anchors employed in marine cableways for coaling at sea. Fig. 1 illustrates the United States battleship Illinois coaling from the United States collier Marcellus in tow at sea. A conical sea anchor is shown attached to the end of a line leading from the

19,750 lb. to support 1½-ton loads.
22,000 lb. to support 2-ton loads.

In the Illinois-Marcellus trials, which took place in May, 1905, loads of 2080 lb. were transported with a tension of only 10,000 lb. on the sea anchor line. Therefore the tensions above are regarded as being ample.

In the author's paper, read in 1904, he stated in reference to the Illinois-Sterling trials that "both sea anchors (which had remained in the hold for 2½ years), weakened by age, failed to withstand the strain of tow-



Fig. 1.—General View of Marine Cableway.—The Marcellus Coalings the Illinois.—The sea anchor line is a single continuous rope, 1700 ft. long, leading from the sea anchor through pulleys at the mastheads of the collier to a relensing hook over the quarterdeck of the warship. The sea anchor line has been shortened by the artist to bring the sea anchor in the picture.

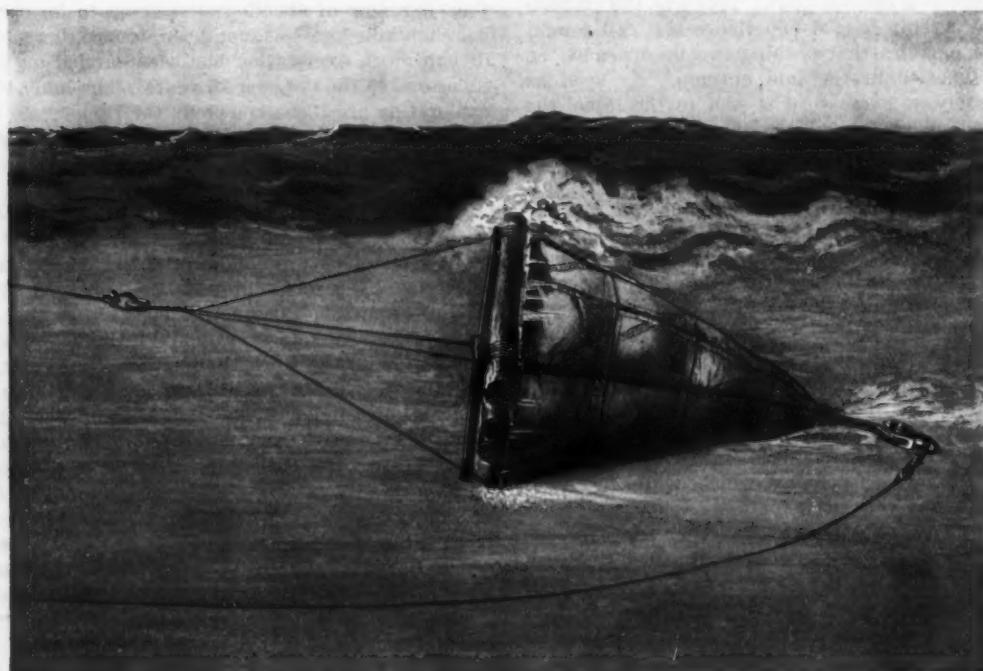


Fig. 2.—Sea Anchor of 5-Ft. Diameter, with Floats, Showing Swivel Wherby the Sea Anchor May Revolve Without Fouling the Wire Tripping Line.

towing ship, the Illinois, and passing through pulleys at the mast of the towed ship, Marcellus. The sea anchor is required to maintain a practically uniform tension in the sea anchor line, permitting the collier to plunge or roll or otherwise alter the distance between the masts of the two ships. Assuming a distance of 400 ft. between ships and employing the average size collier, it will be necessary for the sea anchor to maintain the following approximate tensions:

- 12,500 lb. to support 1-ton loads.
- 14,900 lb. to support 1½-ton loads.
- 17,250 lb. to support 2-ton loads.

ing." Subsequent experiments, which this paper will record, prove that these sea anchors were dragging on the bottom of the sea in the shallow waters where these trials took place. In fact, the very same sea anchors used in the Illinois-Sterling trials were used in the Illinois-Marcellus trials a year later, and when provided with floats to keep them from the bottom proved amply strong for the services demanded of them.

Test of a 5-Foot Sea Anchor.

The 5-ft. diameter sea anchor, 5 ft. long, with stiff bale, shown in Fig. 2, was towed by the Illinois at speeds up to 11 knots per hour in order to determine whether a sea anchor could be made to withstand the strain required and what would be the pulling power of such sea anchor.

* From a paper read at the meeting of the Society of Naval Architects and Marine Engineers, New York, November 22 and 23, 1906. Mr. Miller is chief engineer of cableways for the Lidgerwood Mfg. Company, Brooklyn, N. Y.

The strains that were developed at varying speeds correspond almost exactly to those in the table below:

Table of Strains on Conical Sea Anchors at Various Speeds.
The length being equal to the diameter, stiff rims. With flexible rims, reduce strains as shown in the table about 18 per cent.

Knots.	5 ft. diam.	6 ft. diam.	7 ft. diam.	8 ft. diam.	9 ft. diam.
1.....	102	148	201	263	332
2.....	411	591	805	1,052	1,331
3.....	924	1,331	1,812	2,367	2,996
4.....	1,644	2,367	3,222	4,208	5,326
5.....	2,568	3,699	4,934	6,576	8,322
6.....	3,699	5,326	7,250	9,460	11,984
7.....	4,934	7,250	9,868	12,888	16,312
8.....	6,576	9,460	12,888	16,834	21,306
9.....	8,322	11,984	16,834	21,306	26,965
10.....	10,275	14,796	20,189	26,304	33,291
11.....	12,432	17,903	24,368	31,727	40,282
12.....	14,796	21,306	29,000	37,877	47,939
13.....	17,364	25,005	34,034	44,453	56,261
14.....	20,139	29,000	39,472	52,377	65,240

A sea anchor whose length is equal to the diameter is found to be somewhat erratic in being towed through the water. It will dive, broach and yaw. The strain, however, does not seem to vary as might be expected, although it varies sufficiently to indicate the desirability of producing a sea anchor which should tow straight in the water. At the Experimental Basin a sea anchor was tested whose length was four times its diameter. This sea anchor produced a strain when towed through the water of almost exactly one-half that of the one in which the diameter was equal to the length. It was found that the long sea anchor pulled straighter than the short one, as would be expected. This 5-ft. sea anchor was constructed of No. 1 flax canvas, stitched double. A few stitches were broken after being pulled through the water at a speed of 11 knots. The trials proved that the conical sea anchor could be made strong enough to

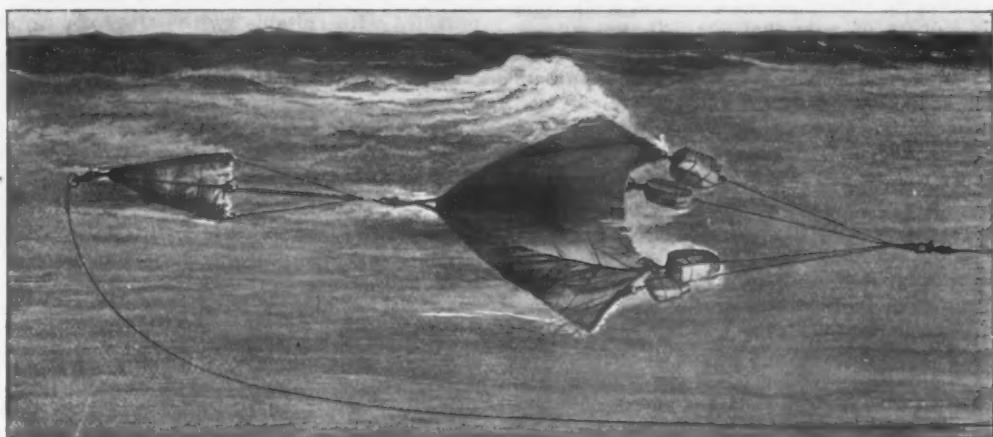


Fig. 3.—Seven-Foot and Three-Foot Sea Anchors Arranged Tandem.—Estimated to Pull 11,700 Lb. at Eight Knots.

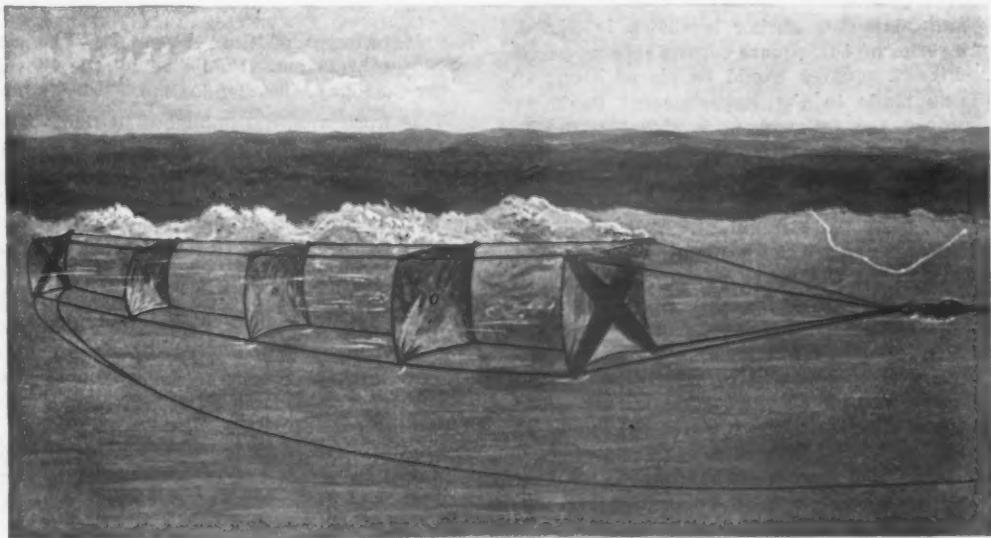


Fig. 4.—Four-Foot Multiplane Sea Anchor.—Space for Storage, 24 Cu. Ft.; Weight Complete, 325 Lb.

At the slow speeds the sea anchor seemed to pull a little more than the table shows, while at the higher speeds a little less. The speed of the ship was reckoned by the turn of the screws. In towing the sea anchor at the higher speed the strain developed was so great that the ship did not go through the water as fast as would be indicated by the revolutions of the engine. Making corrections for this, the table becomes checked sufficiently accurate for all practical purposes. This table was made from data obtained from small sea anchors, by Capt. D. W. Taylor, U. S. N., at the Experimental Basin, Washington, D. C. The sea anchor had a length equal to its diameter and a stiff rim. Upon completion of this trial the stiff bale was found considerably bent, indicating that the flexible bale would be preferable in spite of the loss of pulling power.

stand the strain of being pulled through the water at 11 knots.

The Illinois-Marcellus Trials.

The Illinois-Marcellus trials of the marine cableway were conducted off the Capes of the Chesapeake in May, 1905. At first a 5-ft. sea anchor was used. It settled to the sandy bottom in 13½ fathoms of water. This was because the cableway was set up with the boats practically standing still. As soon as the warship towed the collier, the sea anchor scraped along the bottom and filled with sand. The sea anchor line scraped along the bottom, polishing it very brightly. The sea anchor line was then shortened, and about 6 cu. ft. of white pine, in the shape of spars, was lashed to the 5-ft. sea anchor. A 3-ft. diameter sea anchor was attached to a 5-ft. one in

tandem. The floats were found sufficient to keep the sea anchors from the bottom and no difficulty was experienced whatever. The pair of sea anchors, arranged in tandem, towed almost perfectly straight and the tension was practically uniform. In order to obtain the required strain the ships steamed at about 7 knots. The tow line parted. All the lines of the cableway were immediately cleared and no damage done. Two tow lines were then used, but it seemed desirable not to go too fast.

To obtain more tension and yet keep down the speed of the ships, two 5-ft. sea anchors were next coupled in tandem. Floats were secured to one only. These went to the bottom, indicating that the floats were not sufficient. Seven ft. and 5 ft. sea anchors were then coupled together in tandem with floats on both. There was no difficulty in obtaining all the tension required. The sea anchors pulled very steadily and did not sink to the bottom at any time. The two sea anchors combined produced a strain of 150,000 lb. at a towing speed of 7 knots. It is worthy of note that the 7-ft. sea anchor that was employed was the same that had been on the Illinois for 3½ years, and was found in good condition. On completion of the trials both sea anchors were in good condition, excepting that the stiff bale of the 5-ft. sea anchor was bent. The 7-ft. anchor had a flexible bale.

Fig. 3 shows a 7 ft. and a 3 ft. sea anchor towed in tandem. The latter causes the former to tow straight.

In the first experiments no swivels were employed, either between the sea anchor line and the sea anchor or between the tripping and the bale of the sea anchor. The result was that the sea anchor line revolved and twisted up the sea anchor line about it, causing the line to foul so badly as to make it impossible to trip the sea anchor. In the Illinois-Marcellus trials the tripping line was provided with a swivel, as shown, which completely overcame the difficulty of wrapping one line on the other. The sea anchor was permitted to revolve if it cared to. The experiment indicated the necessity of a swivel between the sea anchor line and the sea anchor.

The Multiplane Sea Anchor.

The new multiplane sea anchor is shown in Fig. 4. It consists of a series of 4-ft. square canvas sheets, spaced 8 ft. apart. Five-ft. squares would be placed about 10 ft. apart. Tests made in the Experimental Basin in Washington proved the following: 1. That with the same amount of canvas the multiplane sea anchor will pull as much as the conical sea anchor where the diameter is equal to the length. 2. With five planes the sea anchor will pull perfectly straight. A full sized sea anchor has been constructed with planes 4 ft. square, placed 8 ft. apart. To the upper part of each square 1½ cu. ft. of cork are attached. Swivels are provided at both ends. This sea anchor was towed in a moderate sea from a tug off Sandy Hook and proved to be wonderfully steady. The pull was uniform. There was no disposition to dive, broach or yaw. The towing speed was about 8 knots, that being the limit of the power of the towboat employed for the purpose. The experiments lasted for two hours, and the sea anchor showed no signs of distress. The sea anchor is tripped by pulling on two of the lines secured to its corners.

The multiplane sea anchor is easier to launch and easier to recover. After detaching each plane (by removing a clip) and coiling up the four corner ropes the whole may be stowed in less space than a conical sea anchor. The total weight is 325 lb.

The experiments indicate that if the planes are placed nearer together the strain will be less; also that with a less number of planes the sea anchor tows less steady.

From tests made of a small sea anchor the following table of approximate strains had been arrived at. This table must be checked by a warship towing a full sized sea anchor at sea, but as it stands it is probably accurate enough for practical purposes:

Table of Approximate Strains on Multiplane Sea Anchor at Various Towing Speeds.

Knots.	Four 4-ft. squares. Pounds.	Five 5-ft. squares. Pounds.
1.....	226	354
2.....	904	1,416
3.....	1,925	3,015

4.....	3,170	4,960
5.....	4,860	7,500
6.....	6,900	10,800
7.....	9,500	14,900
8.....	12,200	19,100
9.....	14,900	23,500

It will be noted that the strains do not increase according to the law of squares, as with the conical sea anchor. For instance, from the above table the 4-ft. sea anchor pulls 9500 lb. at 7 knots, while if the strain increased according to the law of squares the pull would be 11,100 lb. A large variety of other forms were experimented upon, which experiments only confirmed the author in the adoption of the present form.

In comparison with a conical sea anchor, where the diameter is equal to the length and having the same amount of canvas, the multiplane sea anchor is equal in pulling power to the conical, pulls straight and steady, will not dive, broach or yaw, is cheaper and easier to construct, weighs less, stows in less space, and when provided with suitable swivels does not revolve.

New Publications.

A Treatise on Intermittent Gears. By Frank Burgess, proprietor of the Boston Gear Works, Norfolk Downs, Mass. Pages, 63. Illustrated. Paper, 50 cents; cloth, 75 cents.

This little book is packed with data relating to intermittent gears, and probably more details are given of this special form of gear than have appeared in a single publication heretofore. In addition to a new bevel gear chart and tables of horsepower, weight, &c., the author gives diagrams and complete tables relating to the forms of intermittent gears employed in varying lines of service. A number of pages are added, giving valuable information on other subjects, including metric system equivalents, horsepowers of malleable iron chain, horsepowers of single leather belting and tables relating to machine screws with United States standard screw threads, and formulas for threads.

The Metallurgy of Cast Iron. By Thomas D. West. Eleventh edition. Published by the Cleveland Printing Company, Cleveland, Ohio. Price, \$3, postpaid.

This work was first published in 1897. The third edition published in 1901 showed a considerable revision, 20 new chapters being added, dealing with the making, mixing, melting and testing of cast iron, while 13 chapters of cupola practice were transferred to "The Molder's Text Book." In the preface to the eleventh edition Mr. West calls special attention to the work of the Committee on Standardized Drillings of Cast Iron, appointed by the American Foundrymen's Association, of which the author was chairman. He cites also the adoption of standard specifications for foundry pig iron by the American Society for Testing Materials, as in line with the system of grading pig iron by analysis advocated in his earlier editions. The present work has evidently had a wider reading than any of the author's early books on foundry practice, well known as they have been.

Alternating Currents. By C. G. Lamb, M. A., B. Sc., Clare College, Cambridge. Publishers, Longmans, Green & Co., 91 and 93 Fifth avenue, New York. Cloth, 325 pages. Profusely illustrated. Price, \$3.

The preface states that the author has been engaged in lecturing on electrical matters to the students at the Engineering Laboratory, Cambridge, England, and experienced difficulty in recommending a suitable book on this subject. It was felt that a compilation of the more important points was desirable, as a student has not the time to devote to a proper study of the larger books already available in English or German, while smaller books scarcely cover the ground with which the course of study deals. It was also hoped that such compilation might possibly be of some use to teachers in general. The work is therefore offered as a text book for students of engineering. The contents are arranged in 24 chapters. The treatment of the question is largely based on the use of vectors, supplemented by simple analytical methods when it is desired to obtain numerical results.

Trade Publications.

Recorders.—The Bristol Company, Waterbury, Conn. Bulletin No. 41. Intended to show the many different types and ranges of Bristol recording instruments, including voltmeters, ammeters, wattmeters, pressure gauges of portable and stationary form, thermometers and water level gauges. It is only an adjunct to the larger illustrated catalogues and price-lists issued.

Pneumatic Stone Tools.—Chicago Pneumatic Tool Company, Chicago, Ill. Catalogue No. XIX. Describes and illustrates the Keller line of pneumatic stone tools, such as crane surfacers, junior surfacers, rock drills, Lewis drills, baby drills, plug drills, valve and valveless carving tools, air compressors, air receivers and complete plants.

Tachometers.—Empire Machine Company, 210 Third avenue, Pittsburgh, Pa. Circular. Shows the Empire tachometer, which is made in two sizes, the No. 1 registering speeds from 50 to 400, and the No. 2 from 300 to 2500 rev. per min. The descriptive matter makes clear the construction and operation of these tachometers.

Riveters.—Hanna Engineering Works, Chicago, Ill. Catalogue No. 3. Size 6 x 9 in., pages 34. Describes and illustrates the line of Hanna riveters, namely, stationary riveters, portable riveters and compression lever riveters. The construction and operation of these are explained and a tabulated list of sizes and also a list of users is given. Several testimonial letters are included.

Exhaust Heads and Steam Traps.—B. F. Sturtevant Company, Boston, Mass. Two bulletins of the Engineering Series. No. 137 is devoted to the Flinn steam trap, which is of the differential type, and is capable of handling water at any temperature. This trap is claimed to be not affected by vibration or oscillation, and therefore especially adapted to marine practice. Bulletin No. 138 is descriptive of centrifugal exhaust heads. Their action depends upon the fact that centrifugal force is proportional to the weights of the bodies in motion. As water weighs nearly 1600 times as much as exhaust steam, the effect of centrifugal force is to throw it outward with nearly 1600 times the force exerted on the steam. In the Sturtevant head the steam is given a whirling motion, and as a result the entrained water and oil is thrown against the outer casing and trickles down to the outlet at the bottom. The steam, now dry, finds ready escape through a central opening above.

Gaskets and Conduits.—H. W. Johns-Manville Company, 100 William street, New York City. Two pamphlets. One deals with the Kearsarge jointless gaskets, and the other with Portland sectional conduits, which are claimed to give perfect protection and efficient insulation for pipes conveying steam, gas, water or other liquids.

Engines.—Atlas Engine Works, Indianapolis, Ind. Bulletin No. 181. Describes and illustrates the Atlas throttling and automatic single valve engines. The parts are dealt with separately, and specifications of the classes A, B, E, F and EE engines are given. A short description of compound and twin-coupled engines is included.

Generators and Transformers.—Fort Wayne Electric Works, Incorporated, Fort Wayne, Ind. Two bulletins. No. 1080, superseding No. 1058, deals with multiphase revolving field generators, engine driven, and the type AE rheostats. Bulletin No. 1081, superseding No. 1067, pertains to type A transformers, in which descriptive matter and illustrations explain the construction and operation. An insert for catalogue No. 2004 to replace page 73 of the original catalogue is now being distributed.

Westinghouse Products.—The Westinghouse Companies, Pittsburgh, Pa. Catalogue. Size 6 x 8 in.; pages 63. A Spanish edition of a catalogue dealing with the industries and products of the Westinghouse Companies, including the Westinghouse Electric & Mfg. Company, Westinghouse Air Brake Company, Westinghouse Machine Company, Nernst Lamp Company, Cooper Hewitt Lamp Company, Pittsburgh Meter Company, Sawyer-Mann Company, Westinghouse, Church, Kerr & Co., &c.

Wood Working Machinery.—The Oliver Machinery Company, Grand Rapids, Mich. Catalogue B. Size 6 x 9 in.; pages 300. Covers comprehensively wood working and mill supplies for pattern and cabinet makers, furniture workers, carpenters, builders and contractors. It amounts to a compendium of all the machinery and equipment necessary in wood reduction. A profuse number of illustrations show the various machines and their applications, while adequate descriptions and specifications supply the information necessary to round out the pictorial presentation.

Coke.—J. H. Hillman & Son, Frick Building, Pittsburgh, Pa. Postal cards. A series showing pictorially how Hillman cokes are made. In connection with the illustrations are a few words concerning the firm's facilities for shipping and what it is prepared to furnish in standard Connellsburg coke for all purposes.

Thermometry.—The Cambridge Scientific Instrument Company, Limited, Cambridge, England. List No. 39. Deals particularly with electrical resistance thermometers, thermo-

electric thermometers, Féry radiation and absorption pyrometers, continuous temperature recorders, electrical resistance furnaces, &c., manufactured and supplied by this company.

Steam Meters.—The Sargent Steam Meter Company, First National Bank Building, Chicago, Ill. Pamphlet. Contains an illustrated description of the latest form of the Sargent steam meter, which was described in *The Iron Age*, July 20, 1905. An inserted sheet gives a list of users of the Sargent steam meter.

Gas Engine Packings.—The H. W. Johns-Manville Company, 100 William street, New York. Leaflet. Refers to Mobilene sheet packing, claimed to be the only reliable flat packing for gas and gasoline engines, for stationary, marine or motor vehicle service.

Engine Tests.—The Buffalo Forge Company, Buffalo, N. Y. Booklet, second in a series designated as "Engineering Lore." This issue contains a description of the compound engine tests made at the mechanical laboratories of Sibley College, Cornell University, the engine being one of the Buffalo Forge Company's makes, 12 and 18 x 10 in., Class A, horizontal, tandem, compound, high speed.

Industrial Cars.—The Ohio Ceramic Engineering Company, Cleveland, Ohio. Catalogue No. 5. Contains a few illustrations of the line of industrial cars manufactured by this company, the selection of various trucks and cars for transporting and holding raw and unfinished products in factories and warehouses giving a general idea of the extent of the equipment the company is prepared to furnish. Drying racks, turn tables, transfer cars and steel pedestals for benches are additional parts of the equipment referred to.

Galvanizing.—Wilcox, Crittenden & Co., Incorporated, Middletown, Conn. Pamphlet. Contains useful information of how to avoid poor galvanizing, giving simple tests for galvanizing, tinning, &c., which may be applied by any one.

Colburn 42-in. Vertical Boring and Turning Mill.—Bulletin No. 33. An illustrated description of the 42-in. vertical boring and turning mill manufactured by the Colburn Machine Tool Company, Franklin, Pa., and recently placed on the market by this company. Specifications, code words and a summary of dimensions form the contents of this book.

Steel Rolls and Pinions.—Mesta Machine Company, Pittsburgh, Pa. Booklet. Refers to steel rolls and machine molded steel pinions for which are claimed double the strength and wearing qualities of iron rolls and pinions. The company has for many years been making chilled, sand, semi-steel and steel rolls, but has only recently succeeded in making rolls of acid open-hearth steel that give satisfactory results in finishing mills. Nickel steel rolls are also made, consisting of acid open-hearth steel of high carbon and about 3½ per cent. of nickel. Rolling mill pinions are molded in the company's patented gear molding machines. The teeth are not tapered as when made from wood patterns requiring draft, and are claimed to be almost as accurate as if cut. Nickel steel is used in these pinions when desired, and cut pinions of air furnace iron, steel or nickel-steel may be had. Large machine molded and cut gears are other products referred to in this booklet.

Water Meters.—National Meter Company, 84 Chambers street, New York. Two catalogues. One calls the attention of engineers and water works officials to the merits and advantages of the Premier meter. The third concerns the Nash gas and gasoline engines, for electric lighting and water works plants, and supplying power for factories of all kinds. Various installations of the engines are shown in the engravings and combinations of Nash engines, direct connected and belted, to pumps and lighting units.

Machinery.—Webster Mfg. Company, Chicago, Ill. General catalogue No. 30. Size, 6½ x 9½ in.; pages 574. Cloth binding. Covers a full line of elevating and conveying machinery for handling all kinds of material, power transmitting machinery, including rope, shafting, pulleys, hangers, friction clutches, link belting, gearing, gas and gasoline engines, &c., and coal and ash handling machinery. A complete list of prices and dimensions is given and an alphabetical index is appended. The prices quoted in this book supersede all others previously made.

Indicators.—Crosby Steam Gauge and Valve Company, 16 Dey street, New York. Leaflet. The company has begun the issuing of a regular publication called "The Crosby." The first one deals principally with the Crosby steam engine indicator and the Crosby reducing wheel.

Milling Machines.—Cincinnati Milling Machine Company, Cincinnati, Ohio. Booklet. Size, 6 x 9 in.; pages 64. This is the fourth edition of the company's publication entitled, "Examples of Rapid Milling." The illustrations are all taken from actual practice and indicate the class of work for which the company's machines are adapted. In connection with the illustrations data are given concerning the dimensions of the work and cutters, size of cut and feed, &c. Among the new examples shown are those of work done on direct-connected motor-driven machines, and another part of particular interest deals with steam engine work such as the finishing of straps for connecting rods. The publication is issued as a supplement to the company's complete milling machine catalogue.

THE IRON AGE

1855-1906.

New York, Thursday, November 29, 1906.

DAVID WILLIAMS COMPANY,	• • • •	PUBLISHER
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A. L. FINDLEY,	• • • •	
RICHARD R. WILLIAMS,	• • • •	HARDWARE EDITOR

Copper Mining and Some Cherished Economic Theories.

No one industry has in recent years shown developments which compare with those in copper mining. A dizzy level of prices has been reached without any effort to hoist prices; in fact, during the earlier stages of the rise, there was a determined opposition to it on the part of some leading producing interests. The copper trade has good reason to dread any artificial forcing upward of values after its experience with the old Secretan corner and the disastrous boosting of prices by the old Amalgamated management. While it is true that there are in copper mining large aggregations of capital controlling each an important share of the industry in the United States, Mexico and Canada, yet there is no trace whatever of what is often so glibly called a "trust." No one of the great producing interests can alone swing the market, as has been proven, and the history of the industry furnishes eloquent testimony to the fact that some of the most important groups will persist in maintaining their independence of action whatever the temptation may be. Therefore no trust, no community of interest, has had anything to do with the great advance in copper during the past year.

The tariff has nothing whatever to do with prices, since copper is on the free list. There flows in and out of this country, without let or hindrance, an enormous amount of copper in the form of furnace products and of ore, adding greatly to the importance and magnitude of our smelting and refining industry. Costs of production, although they have risen somewhat, have no bearing on the marked advance, because a great part of the metal which the mines yield is being put down, in finished form, in the markets of the world at a cost which is less than half of the current selling price. Indeed, it is susceptible of proof, from the annual reports of the mining companies, that fully 95 per cent. of the copper made in the United States could be sold without loss at 15 cents a pound.

The rise in copper therefore has not been due to any manipulation of trusts, sheltered behind a tariff, which is the favorite method of explaining how the poor consumer is robbed. It has not been due to any material advance in costs, which, while it may not at times be immediately reflected in selling prices, must in the long run shape them when they involve losses.

It has been due solely to an extraordinary demand which has not been checked by adding fully 50 per cent. to what might be regarded as the normal price of 14 to 15 cents. That the requirements have not been adversely affected by what might be regarded as a famine price is another blow at such cherished economic theories.

Another astonishing fact, on the surface, is that production has not been rapidly and strongly stimulated by the exceedingly tempting profits which copper mining is now enjoying. It would appear natural that the managers of mines would go out of their way to get out the

richer part of their properties in order to realize as much as possible of the big returns obtainable. It is possible that some of them may be doing so, but the majority seem to prefer to work their mines systematically as before. Some, it is known, are actually taking out leaner ore because it pays a good profit in times like these, while it could not be treated to advantage when selling prices are nearer the normal.

But after all, the principal reason why output has not responded more rapidly to an enormously enlarged consumption is that it takes a long time to carry out plans for enlargement and to develop new properties. The question of securing funds for them, so often a serious stumbling block, need not be considered in these heydays of prosperity. But even with unlimited resources the modern copper mining property, with its underground work, its surface improvements, its concentrating, smelting and converting plants, needs time. Practically all the new producers and very many of the old ones are low grade propositions. With their 1 and 2 per cent. ores it takes an enormous tonnage, and a corresponding development and equipment in order to make any appreciable impression upon the supply of the metal.

The copper trade is so familiar with this fact that it receives with reserve reports of the big amounts which are to be added to output. We are inclined to believe that this skepticism is being carried too far and that when the statistics of production for 1906 have been gathered the figures will be larger than are now generally anticipated. In other words, a return to a more normal price level may be nearer than seems now possible.

But the cardinal fact remains that copper has reached under the whip of an enormous consumption an unprecedented price, without any trace of manipulation, and thus far without any indication that the high range of values has checked consumption, or unduly stimulated output. No one will claim that the laws of demand and supply have ceased to operate, but there has never been a more striking instance in the history of the mineral industry of how slowly they can at times make themselves felt.

Sheet and Tin Plate Developments.

The increase in the output of sheets in the United States in 1906 promises to be one of the features of the year's statistics in iron and steel. This outcome is contributed to in part by the general increase in consumption of rolling mill products; but a factor of no small importance is the newer uses for sheet metal which have been growing in prominence since the business slackening of 1904. The gas, oil and heating stove trades have probably made record purchases of sheets, and naturally the demand for galvanized sheets for cornice and other exterior work and for black sheets for roofing and corrugated work in the active building campaign of the past two years will be credited with a considerable proportion of the added tonnage. Also due to the building movement, but emphasizing a preference for steel sheets where wood has been used heretofore, is the large consumption this year of metal lath, metal ceilings and interior decorations of pressed steel. Expanded metal has had an increasing vogue. Shaped sheet steel in combination with concrete has also made its contribution to the new tonnage. Prominence should be given in the list of new developments to the enlarging use of sheet steel furniture and office and library equipment. Steel kegs, too, are a growing factor. Probably the most recent important outlet for sheet mill products is in the interior construction of steel passenger cars. Beginning with the Subway and the tunnels of

New York, the steel car seems destined steadily to supplant wooden cars in general passenger service. Automobile works have also been prominent among the new contributors to the sheet industry. Electrical works, while an old dependence, have greatly increased their sheet consumption this year.

In tin plates the increase this year over the record of 1905 has not been so pronounced as in sheets. The roofing demand has been larger, probably by 15 to 20 per cent., due almost entirely to an increased use of the better grades of plates, the consumption of wasters remaining substantially the same as last year's. Certain canning lines have shown some falling off. The tomato pack and the corn pack are reported to have been less this year than in 1905, and the well-known developments in the canned meat industry put at least a temporary check on consumption. Taking the entire canning demand of the country, it is estimated that the total will not fall seriously below that of 1905.

The production of sheets and tin plates by the United States Steel Corporation in 1906 has been estimated at 1,200,000 gross tons, which compares with 924,439 tons in 1905, 735,482 tons in 1904, 763,670 tons in 1903 and 699,621 tons in 1902. The difficulties outside producers of sheets and tin plates had had throughout the year in securing a supply of steel would indicate that the output of such mills has at least not expanded, and it is known that the building of new independent mills in these lines has not thrived in recent years.

The export trade in sheets and tin plates has made some gain in the year. Tin and terne plate exports, which are chiefly to Canada, increased from 6501 gross tons in the first nine months of 1905 to 10,622 tons in the corresponding period of this year. The exports of sheets are not separated from those of plates, but the combined export movement was 51,419 gross tons last year to September 30, and this year to the same date, 78,089 gross tons. A contribution to the tonnage of domestic tin plate mills this year that deserves special mention results from the displacement of tin plate importations. Only 37,755 tons of foreign tin and terne plates came in in the first nine months of 1906, as compared with 54,982 tons to September 30 last year. A present yearly rate of 50,000 tons furnishes a sharp contrast with importations of 329,435 tons in 1890, the year before the McKinley tariff became operative, and an average of 280,000 tons in the five years preceding. The contrast becomes more marked when it is considered that the importations in the years mentioned practically represented the full domestic demand at that time. To-day more than double the above tonnage is being worked up in the United States each year, as indicated by a home production in 1905 of 493,500 tons and an importation of 65,740 tons. For the present year, while the import figure is shrinking, the record of domestic production promises to show a moderate increase in the total entering into various lines of manufacture for the home and foreign trades.

Steel Foundry Expansion.

The growing demand for steel castings has naturally resulted in bringing forth new projects for their production. In numerous instances small establishments are planned, with the intention of catering in the beginning to a more or less local demand, much after the practice of the jobbing iron foundry. The crucible or open hearth process is generally contemplated, though attention is being given to the possibilities of the Tropenas process, in which iron from a cupola is blown in a small converter.

An interesting feature of the contemplated increase in steel foundry capacity is that gray iron foundrymen are considering the manufacture of steel castings in connection with their regular line. It may easily be seen where this juncture of products in one plant might be of great convenience to customers, especially to builders of machinery doing business in the general district served by the foundry. But it would be adding as distinct a department as if one for the manufacture of brass and composition castings were established, and would require expert steel melters to conduct it. Although in using the Tropenas process it is suggested that iron could be drawn from the foundry cupola into the converter and made into steel, yet as pig iron for iron castings contains too great a percentage of phosphorus to make steel, consequently if steel were to be manufactured it would be necessary to charge a cupola for that purpose alone. This would not necessarily prevent the bringing together of the two classes of foundry work under the same roof, but it is an obstacle to the lapping over of the work of the two departments with really economical results. Other objections are raised, among them the difference in molding practice and the element of labor, for the good iron molder is not necessarily a good steel molder.

It is prophesied by enthusiastic proponents of the steel casting that the time is not far distant when each manufacturing community of any size will have its steel foundry, just as it has its iron foundries at the present day. Be that as it may, the fact should not be lost sight of that while a great jump has been made in the use of the steel casting it has been due to causes that have been in existence for several years, as, to take a single example, the use of the new tool steels which have made necessary vastly greater strength of machinery. The use of steel castings will continue to increase, but perhaps not in so great a ratio as in the immediate past. If the number of purposes to which these castings have been put has increased very greatly in the past two years it is not safe to bank upon a like increase in the immediate future. While the manufacture of steel castings promises to be a great industry there is no likelihood that gray iron is to be replaced to such an extent as has been estimated by enthusiasts, for cast iron is strong enough for most purposes, its rigidity commends it, and its greater section is generally not a drawback, while the difference both in foundry cost and in that of working the casting in the machine shop will be a factor.

Barely two years ago the steel foundries were complaining that there was too little business to go round. Failures were recorded in considerable number, as compared with the total of those engaged in the business, though it should be stated in this connection that in several cases promoters had failed to finance their ventures properly. In the meanwhile steel castings have come into much more general demand, as indicated by the difficulty the foundries are experiencing in meeting the wants of their customers. But the iron foundries are also badly congested with work. Probably the advocate of specialized production would argue from existing conditions that there is more than one reason why the gray iron foundry should stick to its line without branching out into others. There may be room at this particular juncture for more steel foundries, or for enlargements of existing foundries, but under the same conditions there is also reason for the establishment of additional gray iron casting capacity. Nevertheless, the fact should not be overlooked that business is now extraordinarily active and cannot be expected thus to continue indefinitely. Too great expansion in an active period means excessive

competition for orders when business slackens. The situation deserves very careful consideration from those who contemplate the steel foundry industry as an investment.

Explosion and Fire Insurance.

The Attorney-General of Massachusetts has rendered the decision, interpreting the statutes for the Insurance Commissioner, that no fire insurance company doing business in the State can legally insure against loss by explosion followed by a fire. The damage wrought by such a fire can be insured against, but payment of the loss must be restricted on the basis of the value of the property after the explosion. If a boiler explosion completely wrecks a building and its contents, and fire ensues, the fire insurance companies could pay for but little damage, because the property had ceased to have material value in the interim between the explosion and the fire. Many progressive insurance men believe that unless the statutes are amended so that fire and explosion insurance can be coupled in a single policy a backward step in insurance practice will have been taken. The insurance laws of the various States are similar in a general way, with a few exceptions, and in these days of follow-the-leader in investigations and enforcement of laws the Massachusetts incident may be repeated elsewhere.

It has been the practice of some of the fire insurance companies to insure property against damage done by explosion preceding a fire by the payment of an additional premium, which in Massachusetts is 10 per cent. of the amount of premium otherwise due. If this cannot be done it appears to indicate a condition under which the manufacturer will be unable to insure his property against certain forms of explosion. He can obtain boiler insurance, of course, but other forms of explosion are probably responsible for greater damage than that of the boiler. Gasoline, dust, gas and various chemicals that enter into processes of manufacture may under certain conditions result in explosions which are costly in themselves, apart from the consequent loss by fire.

When fire follows an explosion there must sometimes be dispute as to where the loss by explosion ends and that by fire begins. This occurs where the fire insurance company issues a policy in which explosion is made an exemption from loss. There usually must be a compromise in case of a boiler explosion followed by fire, if the insured has also provided boiler insurance. The fire insurance company must guard its own interests, and must restrict its payment of losses to what it considers a fair amount, and this is generally considered by the insured to be too small, as manufacturers who have been through a fire usually agree. The including of both forms of insurance in one policy simplifies settlements of losses to an extent. It also cheapens insurance, as a general thing, because it costs less to pay premiums on one policy, with 10 per cent. additional for explosion insurance, than it does to carry the same amount of insurance in two policies.

The time will come, insurance men believe, when a policy will insure against every form of loss to property. Fire, explosion, earthquake, tornado, cave-in, every possible cause will be taken into account in a single policy, risks being intelligently considered, so that the greater the risk the greater the premium. For illustration: The New York real estate owner would not pay the same premium, everything else being equal, as he of San Francisco, because the earthquake element would be lacking; neither would the Philadelphia manufacturer pay more than a moiety for insurance against hurricane, though in St. Louis, with a precedent of serious loss, this risk might

be taken into material account. Discrimination would be much as it is to-day in fire insurance, where certain risks bring very much larger premiums than others.

This all-including policy will come as a gradual evolution, no doubt, if it comes at all, and only with a forward movement in the liberality of treatment of the insurance companies. Businessmen would welcome the extension of fire insurance policies to include losses incident to a fire, but to an extent independent of it, as in the case of the boiler explosion which causes the initial blaze. If during the progress of a fire and as a result of it a boiler explodes, or there is other explosion, its consequent loss is included with that of the fire. But if the explosion comes first its resultant loss is uninsurable in Massachusetts, and in other States with similar laws, if those laws are to be enforced. The insurance companies may have recourse to special charters, or amended charters, procured by act of Legislature. Otherwise they are helpless, unless property owners take up the matter and procure amendments of the statutes to permit of a more liberal general policy. No radical nor at all revolutionary changes would be necessary.

The Mechanical Engineers' Meeting.

The annual meeting of the American Society of Mechanical Engineers will be held in the auditorium of the New York Edison Company, 44 West Twenty-seventh street, New York, December 4-7, and the society's headquarters will be maintained there throughout the meeting. On Tuesday evening at 8.45 the address of the president, Fred W. Taylor, Philadelphia, will be given, the subject being "The Art of Cutting Metals." The discussion of the president's address is a part of the order for the second session, which opens at 9.30 a.m. Wednesday. At the same session the report of the Committee on Standard Proportions for Machine Screws will be presented. On Thursday afternoon the members will go on an excursion over the new electrically equipped lines of the New York Central & Hudson River Railroad, the start being from the Grand Central Station. The usual reception will be held at Sherry's on Thursday evening, December 6. The programme of the sessions for professional papers is as follows, the afternoon session beginning at 2 and the morning sessions at 10 o'clock:

Wednesday Afternoon, December 5.

Power Plant Symposium:

"The Evolution of Gas Power," by F. E. Junge, Berlin, Germany.

"Producer Gas Power Plant," by J. R. Bibbins, Pittsburgh, Pa.

"Steam Turbine Characteristics," by Hans Holzwarth, Hamilton, Ohio.

"A High Duty Air Compressor," by Prof. O. P. Hood, Houghton, Mich.

"Design of an Improved Boiler Setting," by A. Bement, Chicago, Ill.

"The Steam Plant of the White Motor Car," by Prof. R. C. Carpenter, Ithaca, N. Y.

Thursday Morning, December 6.

"Saw-Tooth Roof Construction," by F. S. Hinds, Boston, Mass.

"Ferroinclave Roof Construction," by A. E. Brown, Cleveland, Ohio.

"Saw-Tooth Roofs for Factories," by K. C. Richmond, Providence, R. I.

"Weights and Measures," by Henry R. Towne, New York.

Friday Morning, December 7.

"Mechanical Engineering Index," by Prof. W. W. Bird and Prof. A. L. Smith, Worcester, Mass.

"Ventilation of Boston Subway," by H. A. Carson, Boston, Mass.

"Flow of Fluids in Venturi Tubes," by E. P. Coleman, Buffalo, N. Y.

"Tests of an Elevator Plant," by A. J. Herschmann, New York.

"Test of a Rotary Pump," by Prof. W. B. Gregory, New Orleans, La.

"Improved Transmission Dynamometer," by W. F. Durand, Stanford University, Cal.

"A Plan to Provide Skilled Workmen," by M. W. Alexander, Lynn, Mass.

F. R. Hutton, for 25 years secretary of the society, will be its next president.

A Government Garage for Imported Motor Cars.

The Treasury Department has decided to establish a garage in New York for the purpose of examining and appraising importations of foreign-built automobiles and the registration of domestic cars taken abroad. During the 10 months of the present year the entries of automobiles at the metropolis has increased 33 1-3 per cent. as compared with the imports of the corresponding period a year ago. Last summer the Government found that the floorage at the Federal Appraiser's warehouse was no longer adequate for proper inspections, and quarters were secured in a bonded warehouse adjacent to the Public Stores, but these are already outgrown. Under the circumstances the Government has decided that the only solution of the problem is to have a garage of its own. John H. Edwards, Assistant Secretary of the Treasury, has visited New York and conferred with various customs officials regarding a building for auto examinations. It is believed that a building may be leased on Christopher street, convenient to the steamship piers and only half a block from the Federal warehouse. Automobile interests, however, are in favor of having the Government locate the garage uptown in the midst of the industry. Edward S. Fowler, the Appraiser of the Port, under whose direction the machines are examined and appraised, indorses the sentiment of the trade.

The extraordinary development of the automobile importing industry is apparent from the official figures, which show that from January 1 to October 31 there were imported at New York 1332 cars, including 118 domestic machines, the total appraised value of which is \$4,605,315, in comparison with 911 cars, including 71 domestic cars, valued at \$3,467,404, during the same period of 1905. The Government exacts a duty of 45 per cent. on automobiles, and its revenue from this line of imports alone in the period noted above is \$1,137,911 greater than during the corresponding 10 months last year. It is stated that 95 per cent. of all the automobiles brought into the United States are entered at the Port of New York.

Duty on Ball Bearing Parts.

In a decision by I. F. Fischer, the Board of United States General Appraisers November 24 overruled a protest made by Hensel, Bruckmann & Lorbacker, New York, regarding the rate of duty applicable to ball bearing parts of various dimensions. The Appraiser returned the merchandise as manufactures of steel, with duty at the rate of 45 per cent. The parts consist of an inner and outer steel band or ball race, the space between being fitted with steel antifriction balls, between each pair being a small coiled steel spring. The importers maintained that the articles should be granted duty under the provision in the tariff for steel in all forms and shapes. The board affirms the classification made by the authorities.

Steel Gardening Tools and Twist Drills.

It was decided by the Board of Appraisers November 23 that steel gardening tools and twist drills, imported by H. King's Son and others of New York, are properly dutiable as assessed at the rate of 45 per cent. as manufactures of steel. The importers alleged that the merchandise should be deemed steel in all forms and shapes, with duty accordingly. It was shown that the articles are fully finished and ready for use. This being so, the board was obliged to indorse the action of the appraising officers.

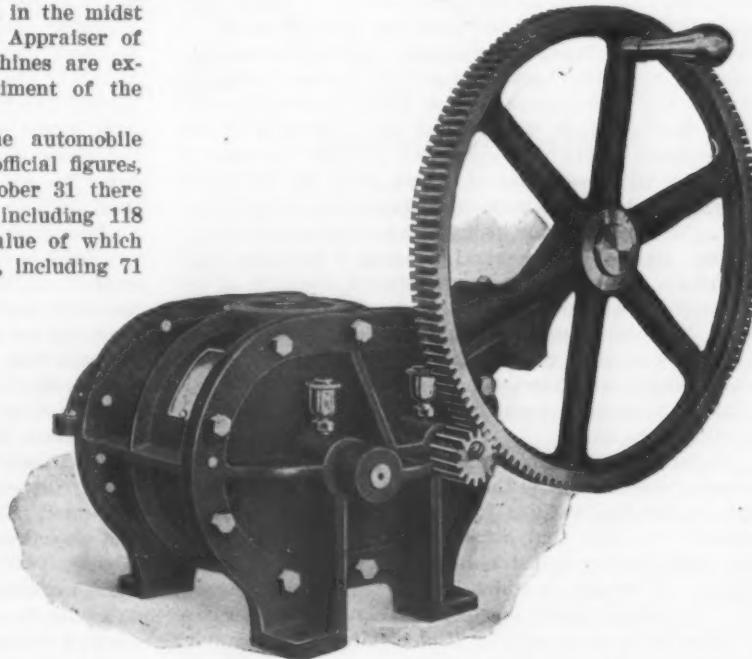
Decision Regarding Fractions of a Dollar.

Judge Somerville, for the Board of Appraisers, has rendered a decision affirming the general practice of the customs authorities in disregarding fractional parts of the dollar in making liquidations. The case before the tribunal appears to have been in the nature of a

test of the practice, as the protestant lost less than half a dollar by the liquidation. In denying the importer's contention that the practice is illegal, Judge Somerville says that the practice at the several ports for customs officers to ignore, as a matter of mutual consent, fractional parts of a dollar less than 50 cents in the invoice of entered goods, and to count 50 cents and upwards as a dollar in assessing duties on importations of merchandise, is a reasonable and desirable one, and would seem, in the long run, to operate as favorably to the importers as to the Government. Such practice is justified under the maxim that the law does not notice or care for trifles.

A New Connersville Blacksmith Blower.

A new undertaking on the part of the Connersville Blower Company, Connersville, Ind., is the manufacture of a line of small pressure blowers, for which an entirely new shop has recently been equipped. The illustration is of one arranged for hand power, but they are also made for power drive. The three sizes at present built,



The No. 35 Hand Power Blacksmith Blower Made by the Connersville Blower Company, Connersville, Ind.

Nos. 35, 40 and 50, have displacements of 173, 288 and 576 cu. in. per revolution, respectively. The standard machines are arranged for top discharge, but they can be made for bottom discharge if desired. The casing and revolving parts are of soft gray iron. The shafts are of steel, pressed into place and pinned. The gears are cut from solid stock and are fitted and pinned to the shaft. The bearings are of bronze, drilled and grooved for oiling. The inlet and discharge openings are tapped for standard pipe connections. All parts are interchangeable and repairs can be furnished promptly. The power required is proportional to the pressure and speed and is based on $\frac{1}{2}$ hp. to discharge 100 cu. ft. of free air per minute against a pressure of 1 lb. per square inch.

The hand blower is built for bottom discharge and has a large gear with a driving handle and a pinion in place of a belt pulley. This construction has been adopted to meet a demand which appeared to exist for a blacksmith blower that can be run by either hand or power, and ordinarily on the opposite end of the blower shaft a pulley is placed, so that belt drive can be used when desired. The arrangement is such that the hand wheel can be thrown out of gear when not to be used.

The Logansport Commercial Club has begun the collection of a \$50,000 fund to be used in locating new factories at Logansport, Ind., and to help, if necessary, to retain those already there. John H. Stephens is president.

OBITUARY.

HENRY WEHRUM.

Henry Wehrum, formerly general manager of the Lackawanna Steel Company, died at Buffalo, N. Y., November 23, having suffered a stroke of apoplexy on Sunday, November 18. Since his resignation from the Lackawanna Steel Company in the fall of 1903 he had lived a retired life. He was born in 1843 in Alsace-Lorraine, and early assumed responsibilities. At 16 he started at the bottom of the ladder in one of the largest iron works in Alsace. Natural aptitude and the closest application brought advancement, and he was soon recognized for marked ability in mechanical and metallurgical lines. He was an earnest advocate of the then new Bessemer steel process, which he closely watched through all its development.

Shortly after the Franco-Prussian War he came to the United States, accepting a position with the old Lackawanna Iron & Coal Company, at Scranton, Pa. His merit soon won recognition, and he rose steadily, becoming chief engineer of the company, which position he held for some years. In 1881 he resigned to accept a call to construct the new works of the Scranton Steel Company as chief engineer. When the Scranton Steel Company consolidated with the Lackawanna Iron & Coal Company forming the Lackawanna Iron & Steel Company he was made chief engineer and general superintendent of the new company. He was appointed general manager in 1896. In all these years of active work he personally superintended all the various undertakings of this company. No detail was too insignificant to escape his watchful eye. Besides being general manager of the large plant at Buffalo, he was director and general manager of the subsidiary companies of the Lackawanna Steel Company. The work undertaken at Buffalo in 1900 involved the most extensive programme of iron and steel works construction ever undertaken up to that time at a single point, and some noteworthy departures from common practice were made.

Under Mr. Wehrum's administration at Scranton the manufacture of rails by the Scranton Steel Company and later by the Lackawanna Iron & Steel Company was developed in a way that attracted attention widely. Mr. Wehrum's mathematical abilities had free play in the field of roll design, in which he was particularly successful. To the chemistry of steel rail manufacture he also brought his unusual metallurgical training, securing some results, both in strength and wearing qualities, with the Scranton rail made from Cornwall ores, that were quite outside the calculation of the books. Mr. Wehrum is survived by his widow, three daughters and a son.

One who knew intimately Mr. Wehrum and his work contributes the following appreciative review of his career:

Henry Wehrum was a great mechanical engineer, remarkably versatile, and thoroughly equipped by his early training in Germany and France. His first problem in this country was to design and erect an up to date rail mill that should evade the patents controlled by the seven large corporations monopolizing the Bessemer product of this country 25 years ago. The result was the Scranton Steel Company's mill in Scranton, Pa., which has remained to this day unexcelled in many features and of which much of the original machinery is yet in operation at the large Buffalo plant of the Lackawanna Steel Company.

The building of this latter plant was the *magnum opus* of his life, and the unfortunate misconceptions and misunderstandings which led to the loss of his services were of most serious import to the company, whose plant, from every rational point of view, he should have had the duty of putting into operation. A calm review of facts must convince any unprejudiced person that there has probably never been erected a plant of equally comprehensive design in which fewer mistakes or errors of judgment can be shown. It is always easy to look back and recognize that certain policies should have been followed which were not; that certain things which were done should have been left undone.

The criticism has been reiterated, and by persons whose knowledge of the inside facts should have barred the thought, that Henry Wehrum had shown bad judgment in attempting to move an old plant: "How much better it would have been to keep the old plant running until the new was ready and then scrap the old." Henry Wehrum was in no wise responsible.

The facts are that the present great plant at Buffalo was essentially the result of evolution. When it was forced upon the attention of the old Lackawanna Iron & Steel Company's Board of Directors that Scranton was no longer a center suitable for the accumulation of the raw material and the distribution of the finished product, and that the advantage of a heretofore cheap fuel had disappeared with the exhaustion of the great accumulation of anthracite culm, Henry Wehrum was called upon for a careful analysis of the advantages and disadvantages in removing the Scranton plant to Lebanon, Pa., where the company had acquired large property and ore interests. While working out this scheme conditions conspired to suggest an alternative location, and Buffalo was decided upon.

All the while the scope of the proposition was growing, but from the first (and at no time was that feature ever modified) everything was based upon the removal of the Scranton plant or such of it as was deemed worthy of removal. Had the ideas as later developed been even considered as within the bounds of possibility a far different story would have been told. It is unfortunate that facts like these are often lost sight of and that criticism secures an apparent foundation that in reality does not exist.

But with all that has been said, Henry Wehrum "built well." He was bold and aggressive, with the strength of his convictions. No one to-day would imagine the criticisms that were heaped upon him for deciding to install gas engines, but he was greatly ridiculed. Other features that he proposed, which were subsequently discarded, may yet be taken up by his successors, as they are proved to be sound in principle.

Through physical disabilities and great natural diffidence Henry Wehrum often created a wrong impression among those who did not get beyond the surface of his character. To those who knew him he was big hearted and affectionate, trusting implicitly those in his confidence. Without jealousy, he encouraged the efforts of those working with him, seeming more like a parent than a master to the younger men about him. No one who worked with or for him will cease to recall pleasantly his genial personality, his strength of character and his personal worth.

GEORGE BANCROFT KILBOURNE, son of Col. James Kilbourne, president of the Kilbourne & Jacobs Mfg. Company, Columbus, Ohio, died at the Grand Pacific Hotel, Chicago, November 22, aged 34 years. Mr. Kilbourne removed to Chicago in September to take charge of the steel car department of the Kilbourne & Jacobs Company. He was a graduate of Williams College, and served as a volunteer in the Spanish-American War.

DR. WILLIAM H. CHANDLER, emeritus professor of chemistry at Lehigh University, Bethlehem, Pa., died November 23, aged 65 years. He was born in New Bedford, Mass., and was graduated from Union College, Schenectady, N. Y., in 1862. He taught for years in the Columbia School of Mines and in 1871 he was called to Lehigh University. Dr. Chandler in 1898 published his Encyclopedia of Universal Knowledge. Hamilton College in 1872 gave him the degree of Ph.D. He was a member of the American Chemical Society, Fellow of the Chemical Society of London, member of the Société Chimique of Paris, and member of the American Association for the Advancement of Science.

WARREN H. GETCHELL, of the Twin City Iron Works, died at Minneapolis, Minn., November 10, aged 82 years. He was born in Bloomfield, now Skowhegan, Maine. He taught school for several terms; in 1846, he went to Boston and engaged as a clerk in a wholesale house; in 1851, he located in business with his brother at Ogdensburg, N. Y.; in 1856, he removed to Minnesota and engaged in

farming at Afton. He remained there until 1882 when he disposed of his property and located in Minneapolis, becoming connected with the Twin City Iron Works, of which for several years he was secretary. He is survived by a son and a daughter, the latter being the wife of President O. P. Briggs of the National Founders' Association.

F. E. FORD, manager of the order department of the Illinois Steel Company, died at his home in Chicago November 24, aged 44 years. He had been associated with the company throughout his entire business life, serving in various capacities.

GENERAL WILLARD WARNER, United States Senator from Alabama in the reconstruction period, who commanded an Ohio regiment in the Civil War, died from a paralytic stroke November 23 at Chattanooga. He was nearly 80 years old. He was conspicuous in the rehabilitation of the iron industry in Tennessee, and leaves a large estate.

PERSONAL.

E. G. Rippel, vice-president of the Buffalo Foundry Company, has disposed of his interest in that company as well as in the Buffalo Crucible Casting Company, the latter company having been organized within the past year. J. L. Osgood succeeds Mr. Rippel as president of the Buffalo Crucible Casting Company. It is probable that Mr. Rippel will establish a business of his own in Buffalo.

R. W. Simpson has resigned as superintendent of the Bessemer Rolling Mills of the Tennessee Coal, Iron & Railroad Company at Bessemer, Ala.

Charles J. Mesta, vice-president of the Mesta Machine Company, Pittsburgh, was recently elected to represent his district in the next Pennsylvania State Legislature. On the completion of his college work, Mr. Mesta became associated with the Leechburg Foundry & Machine Company, where he served through the regular apprenticeship course. After several years on erection and in the draughting department, he became superintendent of that company's plant, which position he held for five years. During this period he was a member of the Council of Leechburg. On the consolidation of the Mesta Machine Company with the Robinson-Rea Mfg. Company, Mr. Mesta was made vice-president.

Commerzienrat Oswald, the head of the firm of Carl Spaeter, of Coblenz, Germany, and president of the Rombach Works, has just sailed for home after a brief tour through the steel making districts of this country.

Robert McF. Doble, of Colorado Springs, formerly of San Francisco, has been retained as consulting and supervising engineer by Curtis & Hine, general managers of the recently organized Central Colorado Power Company, in the development of large hydro-electric power projects on the Grand River, Colorado.

L. A. Wyman has accepted a position in the sales department of the Dayton Pneumatic Tool Company, with headquarters at Dayton, Ohio.

Everett B. Webster has resigned the presidency of the National Steel & Wire Company, whose main office is at 114 Liberty street, New York. He has been succeeded by LeRoy Clark, formerly president of one of the subsidiary companies and assistant treasurer of the National Company. Mr. Webster retains his membership on the Board of Directors and continues as chairman of that body.

Samuel Gompers was elected president of the American Federation of Labor November 24, at Minneapolis, for the twenty-fifth time in the 26 years the federation has been in existence. There was no opposing candidate.

J. H. Plummer, president of the Dominion Iron & Steel Company, Sydney, N. S., has returned from a European trip.

William H. Love, manager of the Chicago office of the Wheeler Condenser & Engineering Company since 1899, will remove to New York January 1, taking the position of general sales manager of the company, with offices at 42 Broadway. The Chicago office will be maintained, and Mr. Love expects to spend a considerable portion of his

time there. He is succeeded as manager of the Chicago office by Grant Beebe.

Isaac A. Brown, for 12 years general labor foreman and superintendent of transportation at the Ohio Works of the Carnegie Steel Company, has resigned to become general foreman of the transportation department of the new plant to be erected by the Jones & Laughlin Steel Company at Aliquippa, Pa., which will embrace four blast furnaces, open hearth steel works, blooming mill and coke ovens. This new plant will be known as the Aliquippa Department of the Jones & Laughlin Steel Company.

Charles W. Hill, engineer and contractor, Birmingham, Ala., has arranged with the Walsh & Weidner Boiler Company, Chattanooga, Tenn., to manage its business in Birmingham and tributary territory. He has removed his offices from the Title Guarantee Building to the Woodward Building, and in the new location will also continue his business as consulting engineer.

John Price Wetherill, Jr., president of the Wetherill Pneumatic Casting Company, Philadelphia, was severely burned November 22 by the explosion of a mold in the foundry.

H. O. Russ, in charge of the Boston office of the Phoenix Iron Company, Philadelphia, Pa., will be succeeded January 1 by William H. Allen, Jr.

The Steel Club Organized.

At a meeting and banquet of nearly 200 representatives and employees of the 13 constituent companies of the United States Steel Corporation, located in the Chicago District, held at the Auditorium Annex, Chicago, November 20, the Steel Club was organized. Its object is to promote friendly relations between its members and to secure a closer affiliation between the men in the service of the corporation and its subsidiary companies. Monthly meetings are to be held, which will be preceded by a dinner, and it is the present intention to have representatives of the different companies give talks on the manufacture and sale of their products in order that those connected with the several subsidiaries may familiarize themselves more thoroughly with the affairs of the other companies.

The club is the outgrowth of the Illinois Steel Club organized a year ago, and which was limited in membership to those connected with the Illinois Steel Company. According to the constitution and by-laws admission to membership is by invitation only. Officers and directors were elected as follows: Frank Baackes, general sales agent American Steel & Wire Company, president; F. T. Bentley, traffic manager Illinois Steel Company, vice-president; J. P. Walker, assistant secretary Illinois Steel Company, secretary; F. T. Llewellyn, Western manager American Bridge Company, treasurer; directors to serve two years—P. W. O'Brien, D. A. Merriman, R. U. Campbell, B. F. Afflick, T. C. Gedge, S. P. McGough; directors to serve one year—W. H. Eaton, F. E. Learned, H. S. Raymond, W. B. Field and A. B. Newmann. The Steel Club Committee which had the meeting and banquet in charge was made up as follows: M. N. Billings chairman; B. F. Affleck, A. B. Eddy, F. S. Hyman, F. Blanchard, B. H. Rader, J. N. Moylan, J. M. Thomas, L. Johnson, J. W. Meeker, E. A. Smith, A. E. Reichman, S. J. Cotesworth, F. L. Koontz, H. R. Cammack, C. H. Kenzell, L. T. Lott, R. I. Capers, H. T. Bennett, A. N. Hobart.

The Pittsburgh Valve & Fittings Company, Pittsburgh, Pa., has practically completed at Barberton, Ohio, a steel and brick foundry building 160 x 360 ft., for malleable castings, equipped with two 35-ton air furnaces and 80 air driven molding machines. Sufficient screw cutting capacity has already been provided. Proper trackage for hauling material and fuel will surround the building, the intention being to carry all raw material under cover. It is expected to start the furnaces in December. This completes the company's series of foundries and gives it the following capacities: Gray iron finished, 40 tons daily; brass, 4 tons daily; malleable iron, 25 tons daily.

An Export Tax on Mexican Dollars.

DURANGO, November 21, 1906.—Under instructions from the Executive, a bill introduced in Congress by Minister Limantour has been approved by the lawmaking body, the object of the measure being to prevent a possible monetary stringency, which might follow heavy exportations of Mexican pesos, consequent upon the steady advance in the price of silver. The measure provides that the exportation of Mexican silver money made in quantities of more than 10 pesos, will, from the promulgation of this law, be subject to a duty of 10 per cent. upon the legal value of the money exported, unless there be shown to the export customs house, at the latest within 30 days after the date of exportation a certificate from the Exchange and Currency Commission that there has been delivered to the latter for coinage, gold in bars, not of native production, or in foreign moneys, which shall fulfill the conditions laid down by article two of the decree of December 22, 1905, for a value equivalent to the sum exported, at the rate of 75 centigrams of pure gold per peso.

Railroad Concessions and Construction.

A company has recently been organized in Maine with the object of building a railroad from the City of Mexico to Merida, the capital of the State of Yucatan. The officers of the company are: W. G. Seaver, president; W. S. Carter and W. J. Allen, vice-presidents; R. E. Briggs, chief engineer; Santiago Mendeza, consulting engineer, and R. C. Fraser, 10 Wall street, New York, secretary and purchasing agent. The company is capitalized at \$1,000,000, which will be increased as construction proceeds. A subsidy from the Government, which is said to view the project with favor, is expected. The railroad will run, as it at present proposes, from the capital to Pueblo, thence to Oaxaca, the capital of the State of the same name, to a junction with the Vera Cruz & Pacific and the National Tehuantepec Railroads, at Santa Lucrecia, and through the States of Chiapas, Tabasco and Campeche to the terminal point in Merida. The distance to be covered is about 1300 miles. The project is as yet in the stage of promotion, but the persons interested are vigorously at work with a view to raise the necessary capital for carrying it to success. The title of the company is the Mexico, Oaxaca & Yucatan.

The Mexican National Railway Company intends to substitute 85-lb. rails for the 70-lb. rails on its main line, and will at once begin to make the change between Monterey and Venegas, and will also make the line between Acambaro and Gonzalez standard gauge.

Walter C. Palmer has been granted a concession for a line of railroad from Chalchihuites, in the State of Zacatecas, to the city of Durango, or other point on the Mexican International, near thereto. Surveys are to be begun within 12 months, and at least 20 km. of the line must be completed in two years, and the entire line within six years. A deposit of \$15,000 has been made by the concessionaire as a guarantee.

A concession has been obtained by A. H. McKay, representing the Rio Yaqui & Pacific Railway Company, for the construction of a line from some point on the Naco & Cananea Railway to Ymuris, a station on the Sonora Railway. The construction must be finished within 18 months.

Industrial Notes.

Considerable interest has been aroused in mining circles by the reported discovery of extensive deposits of tin bearing ore in the State of Aguascalientes. It is said that samples taken to the capital "show the deposits to be rich in metal," and that "in several places small kidneys of pure metal were found." The report of a prospector continues: "The ore is not only in veins in which kidneys are found, but the gangue matter surrounding is impregnated with the metal, a peculiar formation."

Imports of foreign merchandise the first month of the current fiscal year were valued at \$14,972,975.91, against \$12,538,688.59 in July, 1905, an increase of \$2,434,287.36. Goods in the lines represented by *The Iron Age* figure

in the total first given as follows: Machinery, apparatus, &c., \$1,824,080.21; vehicles, \$367,248.52; arms and explosives, \$289,025.21; miscellaneous, \$702,145.56. The values are in Mexican currency. In the same month, in addition to the precious metals, the exports included the following:

Antimony	.....	\$108,265.00
Copper	.....	2,397,325.00
Plumbagina	.....	4,800.00
Lead	.....	379,041.56
Zinc	.....	156,736.12
Other mineral products	.....	964,022.38

The Mexican Light & Power Company, Limited, of the capital, is pushing the sale of electric heating stoves by means of attractive advertisements in the local press. Cost of current for these heaters is quoted at 1 centavo the hectowatt.

The death is reported of Paul Bergner of the City of Mexico, head of the firm which acted as local representative of the Krupp Works, Essen, Germany.

A report comes from Tepic that a large body of iron ore has been discovered near the Santiago River, and that the Governor of the Territory has secured possession of it.

The American firm which some time since obtained a concession to establish a bicycle and automobile factory in Mexico has been granted an extension of time until May next to begin work on the plant.

A dispatch, dated Guadalajara, says: The National Nail Company, has moved all the nail manufacturing machinery of the Paulsen & Co. plant to San Luis Potosi. The machinery of the Mexico City plant has been also moved to San Luis Potosi. It was decided to concentrate the business at that point because of the advantageous freight rates that can be secured on foreign shipments from that city to all parts of the Republic. Ernest Paulsen, head of Paulsen & Co., is president of the National Nail Company; Emilio Elcoro of Mexico City is vice-president and treasurer, and Enrique Deutz of San Luis Potosi is secretary. The present capacity of the plant in San Luis Potosi is 200,000 kilos of wire nails monthly.

At a recent meeting of the stockholders of the Mexican Car & Foundry Company the following officers were elected for the ensuing year: Isaac M. Hutchison, president and general manager; Pablo Martinez del Rio, vice-president; R. J. Gross, secretary; Juan Meneses, assistant secretary; H. N. Cook, treasurer; M. W. Ferris, assistant treasurer. Directors: Isaac M. Hutchison, Pablo Martinez del Rio, A. J. Braniff, R. J. Gross and M. W. Ferris.

It is reported that both the Mexican Railway Company and the Interceanic, the latter a part of the National system, will substitute crude oil for coal under their locomotive boilers, and that the fuel will be supplied by the Pearson Company, which is said to have a number of producing wells at Minatitlan, where it intends to establish a refinery.

According to reports from the city of Guadalajara the Southern Pacific Railway Company has decided to make that point the headquarters of the system in Mexico, and will establish general offices and shops there.

A new coal exploring company, with the title of the Compania Nacional Exploradora de Carbon y Coke, S. A., has been formed in the City of Mexico, with a capital stock of \$1,000,000, and the following Board of Directors: Francisco Madera, president; Manuel G. Guerra, Antonio V. Hernandez, Manuel Aroas and Maurice Ullmann.

The principal railroad systems, notwithstanding great accretions to their rolling stock, still suffer from a shortage of cars to move the continued increase of freight traffic.

J. J. D.

The making of seamless steel tubing is to be started in Italy. William Voysey of Greenville, Pa., an expert in the manufacture of steel tubing, is shortly to go to Italy to install and place in operation the piercing and rolling plants for making this product. It will be his fourth trip across the Atlantic Ocean for the purpose of installing seamless steel tubing plants in Europe.

NEWS OF THE WORKS.

Iron and Steel.

The Shenandoah Steel Wire Company, Buffalo, N. Y., which is building a new wire mill, has placed an order with Humphrey & Sons, Joliet, Ill., for the furnaces and cleaning house equipment.

No. 3 Furnace of the Warwick Iron & Steel Company, formerly the old Anvil Furnace, at Pottstown, Pa., is to start on December 3. It has been out of blast for many years and was recently repaired.

The Allentown Rolling Mills has arranged to start its No. 2 Furnace at Allentown, Pa., which has been out of blast for over a year.

A corporation, to be known as W. H. Nicholson & Co., has been formed at Wilkes-Barre, Pa., for the manufacture of iron and steel. The incorporators are George Nicholson, William Nicholson, S. T. Nicholson and W. H. Nicholson.

The North American Steel Company, Belington, W. Va., is completing the construction of a new plant for the manufacture of high grade planished and common steel sheets. The company is operating as much of the plant as is completed.

The Kemmerer Iron & Steel Company, Scranton, Pa., which is building a rolling mill, has increased its capital stock \$100,000.

After having been in blast for over two years, the furnace of the Nova Scotia Steel & Coal Company at Sydney Mines, N. S., has been blown out for relining. The open hearth department closed down a few days ago and will restart as soon as the furnace is relined, probably about December 25. The open hearth plant has turned out over 7500 tons per month.

General Machinery.

The Elgin Tool Works, Elgin, Ill., has been incorporated, with a capital of \$20,000. This company has been engaged in the manufacture of light high grade machinery and tools for several years. It was started by A. Hasselquist about five years ago, and the firm name was changed later to A. Hasselquist & Co., when a brother, H. S. Hasselquist, was admitted to partnership. Two years ago the name was changed to the Elgin Tool Works, and the plant was moved to larger and more commodious quarters at 22-24 River street. A specialty is made of watch machinery, bench millers, jigs, fixtures, dies, subpresses and subpress dies and tools for the manufacture of typewriter parts and machinery for work requiring great accuracy. The officers of the company are A. Hasselquist, president and treasurer, and R. A. Norling, secretary.

The Milwaukee Trust Company, Milwaukee, Wis., will conduct the affairs of the Wm. Bayley & Sons Company of that city, manufacturer of steam fans, blowers, exhausters and hot blast apparatus, pending a reorganization of the company. The working force has been kept intact, and while the business for a time longer will be conducted under a trusteeship, there is absolutely no danger of the business being discontinued. The reports that have been circulated that the company has retired from business and that its affairs are to be wound up are emphatically denied.

The Clark Gravity Engine Company has been incorporated at Indianapolis, Ind., with \$10,000 capital stock, to manufacture gravity engines and other machinery. The directors are John W. Clark, Thomas Disher and John V. Harding.

The Geo. A. Hogg Iron & Steel Foundry Company, Pittsburgh, is building a complete plant for rerolling rails for the Linton Rolling Mill Company, Terre Haute, Ind. The order includes train and all other necessary equipment, such as conveyors, hot saws, straightening presses, &c. The output will be light rails, weighing from 12 to 40 lb. The plant will be completed in January. The same company is also furnishing three rail conveyors for the new equipment being installed in the plant of the Maryland Rail Company, Cumberland, Md. Among other recent contracts secured are the following: A 38-in. roll lathe and large shear equipped with pinch rolls for shearing sheet bars, for the Canada Sheet & Tin Plate Company, Morrisburg, Canada; 16-in. and 38-in. roll lathes, for the John A. Roebling's Sons Company, Trenton, N. J.; 24-in. roll lathe, for the Ludlum Steel Company, Pompton, N. J.

The Rogers Mfg. Company has been incorporated at Toronto, Ont., with a capital of \$200,000, to manufacture machinery. The provisional directors include A. F. Rietz, A. J. Stanford, Kansas City, Kan., and D. E. Dancey, Goderich, Ont.

The Sherman Cooper Company has been incorporated at Toronto, Ont., with a capital of \$40,000, to manufacture machinery, tools, boats, generators, engines, &c. Among the provisional directors are W. S. Cooper, H. B. O'Dell and J. B. Howse, Toronto.

The Canadian Forge Company, Ltd., Welland, Ont., the construction and equipment of whose plant is now under way and whose product will be forgings of all descriptions, will establish a special department for the manufacture of forgings for steam shovel and dredge work. A specialty will also be made of steam-

ship forgings, such as propeller shafts, built-up marine cranks, connecting rods, &c. The new company is an auxiliary of the Titusville Forge Company, Titusville, Pa., Thos. J. Dillon, formerly superintendent of the latter company, being president and manager of the Canadian company.

Extensive betterments are to be made at the Greenville, Pa., shops of the Pittsburgh, Bessemer & Lake Erie Railroad, operated by the United States Steel Corporation.

The Buffalo Forge Company, Buffalo, N. Y., reports that it has marketed over 400 of its No. 200 geared hand blowers in the last 11 weeks. These figures include only the orders for the blower itself mounted on tripod, with piping, and its No. H H side and center blast tuyere, and does not include the large number sold attached to forges, which are made in over 15 different styles with the Buffalo No. 200 geared hand blower attached. The company has on the market 16 other styles of blowers besides the No. 200, its latest being the Buffalo 202 electric blacksmiths' blower. The latter is arranged for either hand or electric drive. Other recent sales include the Electric Motor & Equipment Company, Newark, N. J., two heating and ventilating equipments with 100-in. fans; Roth & Englehardt, St. Johnsville, N. Y., heating and ventilating equipment with special fan and five-section heater; the Kupferle Bros. Mfg. Company, St. Louis, Mo., heating and ventilating equipment, including 90-in. fan, air washer and humidifier, centrifugal pump, &c.; the New York Steam Fitting Company, New York, heating and ventilating equipment, including 90-in. fan, heater, &c. Mechanical draft apparatus has been sold to the following: Geophysical Laboratory, Carnegie Institute, Washington; the Merchants' Electric Light, Heat & Power Company, York, Pa.

Little of interest has been issued by the Pennsylvania Railroad through the purchasing agent during the past week. Material has been ordered for the construction of the last 10 locomotives on this year's programme of locomotives to be built at Altoona. The programme for 1907 work at Altoona has not yet been issued, though it is rapidly nearing completion. Diligent inquiry from authoritative sources has failed to elicit any knowledge of the rumored construction of a large electric power plant on the middle division, a short distance east of Iroquois. It is hardly likely that such an undertaking will be commenced, at least until data have been compiled from the working of the West Jersey & Seashore Railroad, which has only just begun.

Power Plant Equipment.

The Kerr Turbine Company, Wellsville, N. Y., through its Philadelphia agents, B. Remmers & Sons, 328 The Bourse, has secured the contract for the new power plant to be installed in the Bennett Building, Fulton and Ann streets, New York. The power plant, which will consist of steam turbine generators of a combined capacity of 200 kw., will be made up of two 75-kw. Burke generators, direct connected to a 24-in. six-stage Kerr turbine, and one 50-kw. Burke generator, direct connected to an 18-in. six-stage Kerr turbine. The Kerr Turbine Company maintains a permanent exhibit in operation in the exhibition department of the Philadelphia Bourse.

The Walsh Governor Company has been incorporated at LaPorte, Ind., with a capital stock of \$40,000, to manufacture engines, machinery, &c. The directors are Chas. N. Walsh, Wm. N. Rumely and A. J. Rumely.

The Ohio & Western Lime Company, with main offices at Huntington, Ind., has decided to equip its 30 plants in Ohio and Indiana with electrical power. Peter Martin is president.

The Connally-McIlheran Electrical Engineering Company, Chattanooga, Tenn., has secured a contract for installation of a complete 100-light electric plant for the Mission Ridge Clay Company, Mission Ridge, Ga., and has a considerable number of contracts pending for generators and engines.

The City Council of Vevay, Ind., will receive bids to December 17 for furnishing boiler and engine to operate generator. Address the City Clerk.

The Grote Mfg. Company, Evansville, Ind., manufacturer of hand and power elevators and the Grote sectional steam and hot water heating boilers, is now occupying premises 175 x 200 ft., three stories. F. Grote is president and treasurer; F. W. Joergens, vice-president, and Wm. Hartman, secretary.

The Glisen Mfg. Company, Fort Washington, Wis., is to build a factory at Guelph, Ont., for the manufacture of gasoline engines, office chair irons and other articles of which they make a specialty.

The Stroudsburg Engine Works, East Stroudsburg, Pa., has completed a 50-ft. addition to its plant and installed new machinery which will considerably increase the capacity, enabling the company to produce from 8 to 10 hoisting engines a month. The company has employed as superintendent F. W. Frederick, a mechanical engineer, formerly with the Edgar Thomson Steel Works, Pittsburgh, Pa.

C. A. Dissinger, Brother & Co., Wrightsville, Pa., manufacturers of gasoline engines, are to move their plant to Columbia, Pa., where new buildings will be erected which will give the firm greatly enlarged facilities. The capital stock of \$42,000 is to be

increased to \$75,000, parties in Columbia taking the \$33,000 of increase. The site for the new plant has not been selected.

Foundries.

The malleable foundry of the Grand Rapids Malleable Works, Grand Rapids, Mich., which was recently destroyed by fire, is being rapidly rebuilt. Within 15 days after the plant was destroyed a force of molders resumed work, and at the present time there are 36 employed. It is not probable, however, that the entire plant will be completed before spring.

The Saginaw Semi-Steel Works has organized at Saginaw, Mich., and will erect a foundry for the manufacture of semi-steel castings. William Crawley, formerly connected with the Bay City (Mich.) Industrial Works, heads the project.

The Lorain Casting Company, Lorain, Ohio, which was recently incorporated, will erect a plant for the manufacture of gray iron castings, which will be in charge of H. D. Davison, who for many years was superintendent of the Lorain Foundry Company. Besides Mr. Davison, Capt. R. Thew, E. M. Pierce, Orville Root and D. G. Nichols are interested.

The Richmond Foundry & Mfg. Company, Richmond, Va., expects its new works to be finished and in operation by about January 1.

Hunt, Helm, Ferris & Co., Harvey, Ill., have recently completed an addition to their gray iron foundry, doubling its capacity, and are now in a position to take in job work. Heretofore they have only had a capacity to supply the wants of their own factory. Their new foundry is equipped with all modern appliances and is particularly suited to the making of small, high grade castings.

The American Car & Foundry Company has made arrangements for building a \$190,000 addition to its car wheel plant at Madison, Ill., opposite St. Louis. Construction will be started as soon as possible, and it is expected that the annex will be ready for use early in the spring of next year.

The Model Brass Foundry Company has been incorporated at Buffalo, N. Y., with a capital of \$5000, to manufacture castings, tools, &c. The incorporators are F. Popp, J. Popp and J. Epp.

The Wheatland, Pa., plant of the Sharon Foundry Company, which has been closed down for repairs in its open hearth department, will shortly resume operations. In common with all other mills of the Shenango Valley, this plant is away behind with its orders.

The recent fire at the foundry of the Capital Iron Works, Topeka, Kan., did very little damage to the cupola or other machinery. The foundry will be rebuilt on its original plans.

The Lynchburg Foundry Company, Lynchburg, Va., is adding equipment to its Radford works, increasing the tonnage, and expects within the next three months to be turning out 100 tons of cast iron pipe per day.

Fires.

The ice plant of Karnes & Lott, Carlinville, Ill., was destroyed by fire November 19, the loss being placed at \$10,000.

The leather plant of Randel & Mentz, Newark, N. J., was destroyed by fire last week, the loss being \$10,000.

The coal tipple of the Fairmount Coal Company, Middletown, W. Va., was burned November 20. The loss is placed at \$10,000.

The main building of the H. C. Thompson Clock Company, Bristol, Conn., was destroyed by fire November 21, together with its machinery. The loss was \$10,000. The north building, containing presses, dies and unfinished material was saved. The building will be replaced at once.

The power plant of the Clearfield Electric Light & Power Company, Clearfield, Pa., was wrecked by an explosion November 25. The loss is placed at \$75,000.

The machine shop of the Robert Rom Company, Milwaukee, Wis., was partially destroyed by fire last week, the loss being about \$25,000.

Hardware.

The Goodell-Pratt Company, Greenfield, Mass., manufacturer of tools, has begun the erection of a new storehouse, three stories high, containing 10,000 sq. ft. of floor space, and of concrete and steel construction.

The America Company, Momence, Ill., manufacturer of fishing reels, typewriters, sewing machines and hardware specialties, has gone into voluntary bankruptcy. Walter C. Libby of Danville has been appointed receiver. The assets are placed at \$25,000.

The Safety Door Hanger Company, Ashland, Ohio, is booking a large number of orders ahead for delivery in 1907. Some additions have been made to the plant which have increased the capacity 25 per cent.

The Chandler & Art Brass Works, Richmond, Ind., manufacturer of the Richmond galvanized steel stepladder, has increased its capital stock from \$50,000 to \$100,000. Many improvements in the plant and enlargement of capacity are contemplated and will be put under way at an early date.

The E. C. Sovereign Company, Rockford, Ill., manufacturer of hardware specialties, including neck yokes, tire shrinkers, circle posts, harness books and dressing, leather workers, &c.

has incorporated with \$20,000 capital. The incorporators are C. Eugene Sovereign, Henry M. Hocking and Frank W. Frostle.

Machinery is now being installed in the new plant of the E. A. Pfleuger Company, Akron, Ohio. The company expects to be in operation by March 1 next. The factory is a brick building, three stories and basement, 60 x 140 ft., equipped with 100 hp. boilers and engine, also electric lighting plant, making it one of the largest plants in the United States devoted exclusively to the manufacture of fishing tackle. The business will be under the direct management of the president of the company, E. A. Pfleuger, who is well known to the trade through his connection with the fishing tackle business for the past 25 years.

The stock of the Border Bolt & Lock Nut Company, Richmond, Ind., has been transferred to a syndicate composed of Cincinnati and Philadelphia men. The plant will remain at Richmond, and its capacity is to be greatly increased. William Holbin of Philadelphia has been appointed general manager, and it is stated that the new organization has ample capital to develop the business.

Wallingford Mfg. Company, Wallingford, Vt., manufacturer of hand farming and garden tools, grass and corn hooks, hay knives, &c., has made extensive improvements during the past summer which have more than tripled the capacity of its plant. The company states that it is now in excellent position to take care of its growing business and that it expects to turn out this season close to 60,000 dozen of goods.

The New Bedford Cordage Company, New Bedford, Mass., is to erect a three-story mill, 86 x 102 ft. A contract has been placed with the New Bedford Foundry & Machine Company for four forming machines and a rope laying machine for rope 3 to 6 in. in diameter.

Smith & Post Company, Milwaukee, Wis., has recently been incorporated with a capital of \$100,000 and will engage in the manufacture of two specialties, one being the Post cut-off saw, which is a circular saw for cutting bars, angles, &c., with an ingenious friction feed that automatically adjusts itself to the work and for which a patent is pending. A grinder will also be built for sharpening the saws used on this machine. The other specialty will be a gyratory stone crusher, which will also be patented. Both these specialties have been thoroughly tested. The officers of the company are T. L. Smith, president and treasurer; C. F. Smith, vice-president, and W. J. Buckley, secretary. E. W. Meyer is mechanical engineer.

The Strubler Computing Scale Company has incorporated at Elkhart, Ind., with \$25,000 capital stock, to manufacture computing scales. The directors are Chas. G. Strubler, Chas. B. Brodrick and others.

The Universal Wood Mfg. Company has been incorporated in Connecticut to manufacture wheelbarrows and other goods at Hazelwood, Pa., where a factory is now under construction. The company states that it has purchased the greater part of the machinery that will be required, and that it expects to be manufacturing in 90 days. The capital stock is \$35,000, and the officers: President, A. W. Pence, Grafton, Pa.; vice-president, Frank M. Brown, Shelby, Ohio; secretary and treasurer, W. H. Cochrane, Pittsburgh.

McGlashan, Clarke & Co., Niagara Falls, Ont., manufacturers of flatware and cutlery, both in silver and nickel silver, have completed their new plant. The main factory building is 70 x 300 ft.

Tuthill Spring Company, Chicago, Ill., has lately installed a new 75-hp. gas engine made by J. Thompson & Sons Mfg. Company, Beloit, Wis., which is operated with gas produced from anthracite pen coal and by which the company effects a considerable saving in bills for power.

Miscellaneous.

The Powers Paper Company, Holyoke, Mass., contemplates the building of what is said to be the largest paper plant in the world. It will be located in or near Holyoke, and according to the announcement will be 200 x 300 ft., giving a floor area of 240,000 sq. ft. The cost will be about \$200,000. A large steam plant will be installed, and electric drive is under consideration, according to the statement made at Holyoke.

The General Fire Extinguisher Company, Providence, R. I., has voted to increase its capital stock from \$2,500,000 to \$3,500,000. The Board of Directors has authorized the sale to shareholders of an amount of treasury stock equal to 20 per cent. of their present holdings. The authorized capital stock is \$5,000,000. The company manufactures not only fire extinguishing apparatus, but carries on a general business of manufacturing and jobbing pipe, fittings and valves, the installation of steam and hot water heating, boiler connections and hydrant piping. The officers are: President, F. H. Maynard; vice-president, Russell Grinnell; second vice-president, W. A. Neracher; treasurer, Walter S. Hackney; secretary, Frederick W. Hartwell; directors, these officers and O. C. Barber, G. Gunby Jordan, Charles Baird, Edward Holbrook and E. O. Richards.

The Muncie Auto Parts Company, Muncie, Ind., has increased its capital stock from \$15,000 to \$50,000. Harvey L. Hooke is secretary.

The Connersville Motor Vehicle Company has incorporated at Connersville, Ind., with \$50,000 capital stock, to make automo-

biles. The incorporators are John B. McFarlan, Sr., Joshua H. Morrison, Scott Michener, John B. McFarlan, Jr., and Chas. E. J. McFarlan.

The galvanized tank department of the J. H. Watson Company, which was left at Crawfordsville, Ind., after the removal of the main factory to Kankakee, Ill., has been sold to M. B. Blinford and C. O. McFarland of Crawfordsville, who have reincorporated with \$20,000 capital stock under the name of the Crawfordsville Tank Company.

The Swan Rubber Company, manufacturer of mechanical rubber goods, Berlin, Conn., is to build an addition to its works, the dimensions of which have not been decided. A 300-hp. engine has been ordered.

The new plant being erected by the Wheeling Can Company, Wheeling, W. Va., will have a floor space of 16,000 sq. ft., and will be equipped with machinery of its own manufacture. The company is also adding a building with a floor space of 40,000 sq. ft., which will be used for storage purposes.

The Long Island City Factory Company, 140 Nassau street, New York, is to build two four-story factory buildings at Long Island City, each 50 x 200 ft., which are to be rented for manufacturing purposes.

James Stanley is organizing a company at Mooreland, Ind., to build an automobile factory to manufacture a machine he has invented, which, he says, can be sold for less than \$400.

The Empire Metal Company, Syracuse, N. Y., manufacturer of Babblit, solder and metal alloys, has broken ground for the erection of a new plant on East Water street, which will be two stories high, 66 x 132 ft. The building will be constructed of brick and reinforced concrete and will be equipped with modern machinery. The erection of this larger plant was made necessary by the expansion of the business. Charles Van Wagner, Andrew J. Demott and Edward H. Dann are proprietors.

Work was begun at Houston, Texas, toward the construction of a plant for the Petroleum Iron Works Company, Washington, Pa., on property recently purchased in that city. The plant will be equipped to manufacture oil tanks, standpipes, &c.

A meeting of the stockholders of the Standard Underground Cable Company will be held in Pittsburgh on January 22, 1907, for the purpose of voting for or against an increase in the capital stock. The company, which was organized in 1889, has twice increased its capitalization. In 1899 it was increased from \$1,000,000 to \$1,500,000, and in 1902 it was increased to \$2,000,000. The company is the largest manufacturer of insulated wire and cable in this country, and is reputed to be one of the largest individual users of copper in the world. M. W. Watson is president; J. W. Marsh, vice-president and general manager; F. A. Rinehart, secretary and treasurer.

The American Car & Foundry Company has reopened its shops at Depew, N. Y., which have been closed several years.

The Snyder Electric Company, Pittsburgh, will be incorporated by C. L. Kerr, J. W. Hanley and Elliot Frederick to carry on an electric contracting business.

The Fuel Economizer Company has been incorporated at Jamestown, N. Y., with \$5000 capital stock, to manufacture a smoke consuming device. The incorporators are G. A. Wood, F. Bauer and F. J. Hutchinson.

The Supreme Heating Company is building a large plant at Welland, Ont., for the manufacture of stoves. The two largest buildings of the plant will be 60 x 500 ft. and 60 x 300 ft., respectively, and there will also be several smaller buildings.

The Goderich Wheel Rigs Company, Goderich, Ont., is to erect a factory costing approximately \$100,000.

The Standard Fittings & Valve Company, recently incorporated at Guelph, Ont., with a capital of \$100,000, has purchased a site and will erect a \$25,000 factory building. The principal articles to be manufactured will be plumbers' supplies and wrought iron pipe. The new company is the Canadian auxiliary of the Ald-Don Company, Troy, N. Y.

The Dominion Radiator Company, Toronto, Ont., is about to erect a new factory on Dufferin street, which will double the capacity of its plant. The additional facilities will enable the company to engage in the manufacture of steam fittings on a large scale.

The Auto Car Equipment Company, Buffalo, N. Y., is planning the erection of a branch factory at Niagara Falls, Ont.

The British Pig Iron Market.—In the week preceding November 16 the price of Cleveland pig iron warrants, as quoted by the British iron trade journals, went as low as 56s. 8d. and No. 3 Cleveland pig iron was sold by makers at 57s. 6d. for early delivery. Realizing by weak speculators caused the slight decline in warrants which had been at 57s. 9½d. two weeks preceding. Exports of pig iron from the Cleveland district promise to make this the best November on record. The November total to the 14th inst. was 59,730 tons, as against 55,730 tons in the first 14 days of October. The stock of Cleveland pig iron

carried by Connal & Co. was 568,814 tons on November 15; of this amount 543,887 tons was No. 3 iron. Producers have very little iron in stock, probably less than at any time since the Durham miners' strike in 1892. More hematite iron is wanted for shipment abroad, both to the United States and Germany, than for a long time. Makers ask 70s. 6d. Larger shipments of foundry iron are looked for, to the United States as well as to Germany.

The Yale & Towne Plan of Raising Wages.

Henry R. Towne, president of the Yale & Towne Mfg. Company, Stamford, Conn., at a meeting of its superintendents and foremen, held last week, made announcement of an increase of wages and piece rates which is of much interest. The facts, as stated in the Stamford Advocate, are substantially as follows:

Although the average rate of wages and the average rate of piece work earnings, in the Yale & Towne Works, are both higher to-day than at any previous period, the company recognizes that under present industrial conditions a review of these rates is expedient and that in some cases a reasonable advance may be justified. Accordingly, the company is now engaged in a careful revision of wages and piece rates in all departments. As soon as this can be completed, a readjustment of these rates will be made, on a basis which, assuming the number of employees to remain as at present, will probably involve an addition to its annual payroll of upwards of \$75,000, additional to increases recently made which aggregate more than \$45,000.

In the distribution of this voluntary addition to the earnings of its employees the company will give special consideration to length and quality of service, and to individual efficiency. All piece rates, as well as all day rates, will be reviewed, and where necessary will be readjusted. In each case the rates in effect December 1, 1905, will be taken as the base, and changes since that date will be considered in connection with those now contemplated. The new day rates will take effect as of December 1, 1906. The revision of piece rates, upward of 20,000 in number, will necessarily require more time, but it is expected that all of this work also will be completed on or before January 1, 1907.

The company's intention in making this revision of rates is to readjust and equalize both day rates and piece rates in every department, and for all classes of work, in such manner as to place them on a basis which shall be just and fair to all concerned. In return the company will expect to receive from each and all of its employees honest, loyal and efficient service. The company hopes that the record of the coming year in quality and quantity of production and in all departments will show that its action in making this advance of rates has been appreciated and reciprocated.

This revision of rates will apply to all employees in the works, except those paid by salary. The salary list will be considered separately, and individual cases will be acted on currently in the usual manner.

It is estimated that December dividends of the larger corporations, whose securities are listed on the New York Stock Exchange, will amount to \$90,000,000. The Standard Oil Company leads with \$9,750,000, the American Tobacco Company is next with \$4,024,245 and the United States Steel Corporation is third with a disbursement of \$2,542,476 on its common stock.

The long proposed scheme of harnessing the Victoria Falls of the Zambezi River will be undertaken at once with united British and German capital. Electric power will be supplied to the industries of Rhodesia and the Transvaal, including the Rand. Probably a number of electric railroads will get power from the same source.

At Buffalo, N. Y., it is announced that the New York Securities Company, through a subsidiary corporation, the Economic Power & Development Company, will apply for a franchise to supply steam heat to the residence districts of the city. Three stations are already planned.

The Iron and Metal Trades

The Pig Iron markets are buoyant, and prices are advancing, both for Domestic and Foreign Irons. Some good sales are still being made for delivery during the first half of 1907, and inquiries are now appearing in increasing volume, and in improving character, for delivery during the second half of the year, in spite of the present high level. The majority of sellers decline to commit themselves so far ahead.

The most interesting transaction during the week has been the purchase by the International Harvester Company of about 20,000 tons of Middlesbrough Iron for delivery via New Orleans. It is reported that this Iron was sold at close to \$21, ex-ship, New Orleans, the freight rate to Chicago being \$2.09. To what extent this Iron will be applied to export work, with drawback of duty, does not appear. A short time since a cargo of Scotch Iron was also sold for the Chicago District, via New Orleans.

Foreign Iron is coming into tidewater markets steadily, and in the case of Scotch makers' brands are now difficult to secure for shipment prior to the middle of January.

The scarcity of Bessemer Pig is very pronounced, and is most keenly felt in the Malleable Iron industry, where some large inquiries are at hand. The big steel makers are simply out of the market and try to worry along as best they may. Recently Pig Iron has been shipped from the Chicago plants of the Steel Corporation to works in the Valleys and Pittsburgh, to help out. This is reversing the movement which took place earlier in the year.

Recent developments in the Cast Iron Pipe industry indicate the position of consumers of Pig Iron. Their customers are appearing in the markets at a surprisingly early date. Thus the New England water companies, who usually wait for placing their orders until March, are even now making inquiries for next season's requirements. Among the recent sales are 5000 tons to the Great Northern Railroad, close to 5000 tons for Norfolk, and 3000 tons for the Brooklyn Union. The Consolidated Gas Company is in the market for 6000 tons.

The Rail mills have taken only minor contracts lately. It is estimated that they have now on their books orders for 1907 delivery aggregating 2,000,000 tons. The quantity of unfilled orders to be carried over from this year will probably not be as large as at one time estimated, since the mills have been doing some very heroic work in the way of production during recent months.

The advance in the price of Steel Plates of \$2 per ton is now practically universal.

Specifications for Bars, Wire, Sheets, Tubes and Tin Plate are rolling in, and the mills are under heavy pressure. Some good additional orders are being booked. One mill took 120 miles of 10 to 12 in. Pipe for a new gas line. The Burmah order does not appear to have been definitely placed.

Scrap materials are in a very strong position, some important sales having been effected in the Pittsburgh District up to \$20 per ton for Melting Scrap. Material of this character is being drawn from eastern Pennsylvania to New England and the West, the attitude of Eastern Steel makers being adverse to the rising prices.

The Ore situation is creating some concern, since it is possible that the full quantities required for the winter may not be brought down. The Steel Corporation has thus far brought down 20,400,000 tons. The programme called for 21,500,000 tons, so that 1,100,000 must still be carried down the lakes before the close of navigation. If weather proves favorable it may yet be done.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

Nov. 28, Nov. 21, Oct. 31, Nov. 20,

PIG IRON, Per Gross Ton: 1906. 1906. 1906. 1905.

Foundry No. 2, Standard, Philadelphia	24.00	\$23.75	\$22.50	\$18.25
Foundry No. 2, Southern, Cincinnati	25.00	25.00	20.50	16.75
Foundry No. 2, Local, Chicago	25.50	25.50	22.50	19.50
Bessemer, Pittsburgh	23.35	22.85	22.85	18.10
Gray Forge, Pittsburgh	22.85	22.85	20.85	16.85
Lake Superior Charcoal, Chicago	26.00	25.50	22.50	20.00

BILLETS, &c., Per Gross Ton:

Bessemer Billets, Pittsburgh	29.50	29.50	29.00	20.00
Forging Billets, Pittsburgh	36.50	36.50	36.00	30.00
Open Hearth Billets, Phila.	33.00	33.00	33.00	30.00
Wire Rods, Pittsburgh	37.00	37.00	35.00	32.50
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00

OLD MATERIAL, Per Gross Ton:

O. Steel Rails, Chicago	20.50	20.50	18.50	16.50
O. Steel Rails, Philadelphia	20.00	19.50	18.75	18.25
O. Iron Rails, Chicago	28.00	28.00	26.50	23.00
O. Iron Rails, Philadelphia	27.50	26.50	25.50	24.00
O. Car Wheel, Chicago	24.00	23.00	21.50	18.00
O. Car Wheels, Philadelphia	23.00	22.50	21.50	17.50
Heavy Steel Scrap, Pittsburgh	20.00	18.50	16.75	18.00
Heavy Steel Scrap, Chicago	17.50	17.50	17.00	15.25

FINISHED IRON AND STEEL,

	Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined Iron Bars, Philadelphia	1.83½	1.83½	1.83½	1.83½	
Common Iron Bars, Chicago	1.71½	1.71½	1.71½	1.85	
Common Iron Bars, Pittsburgh	1.80	1.80	1.75		2.04
Steel Bars, Tidewater, New York	1.74½	1.74½	1.64½	1.64½	
Steel Bars, Pittsburgh	1.60	1.60	1.50	1.50	
Tank Plates, Tidewater, New York	1.84½	1.74½	1.74½	1.74½	
Tank Plates, Pittsburgh	1.70	1.60	1.60		
Beams, Tidewater, New York	1.84½	1.84½	1.84½	1.84½	
Beams, Pittsburgh	1.70	1.70	1.70	1.70	
Angles, Tidewater, New York	1.84½	1.84½	1.84½	1.84½	
Angles, Pittsburgh	1.70	1.70	1.70	1.70	
Skelp, Grooved Steel, Pittsburgh	1.65	1.65	1.57½	1.55	
Skelp, Sheared Steel, Pittsburgh	1.70	1.70	1.60	1.65	

SHEETS, NAILS AND WIRE,

	Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, No. 27, Pittsburgh	2.50	2.50	2.50	2.20	
Wire Nails, Pittsburgh	1.90	1.90	1.85	1.80	
Cut Nails, Pittsburgh	1.95	1.95	1.90	1.65	
Barb Wire, Galv., Pittsburgh	2.35	2.35	2.30	2.25	

METALS, Per Pound:

	Cents.	Cents.	Cents.	Cents.
Lake Copper, New York	22.75	22.50	22.25	17.87½
Spelter, St. Louis	6.30	6.25	6.17½	6.25
Lead, New York	6.00	6.05	5.90	5.75
Lead, St. Louis	5.87½	5.87½	5.90	5.55
Tin, New York	43.40	42.70	42.25	34.25
Antimony, Hallett, New York	25.00	25.00	25.00	12.50
Nickel, New York	45.00	45.00	45.00	40.00
Tin Plate, Domestic, Bessemer, 100 lb., New York	\$4.00	\$4.00	\$4.00	\$3.59

Chicago.

FISHER BUILDING, November 28, 1906.—(By Telegraph.)

The purchase of 3500 tons of Scotch Iron by the International Harvester Company marks the first invasion of this market by foreign makers on the present rise, and the continued deferred deliveries of domestic Pig and abnormal prices for immediate needs will accentuate this movement during the next few months. Negotiations are pending for an additional large tonnage, and inasmuch as the Harvester Company has an extensive export trade the drawback which will be allowed on imports places the net price of its late purchase at several dollars a ton below the present local quotations on Southern grades. This Iron will be shipped via New Orleans, low transportation charges being favorable to this routing. Consumers generally are complaining of deliveries, one large interest reporting that it has 19,000 tons due from furnaces. Notwithstanding this apparent shortage, spot Iron is to be had at top prices, and for this reason foundries are displaying a growing willingness to entertain propositions from foreign shippers. The shortage of Malleable Bessemer, according to reports, is acute, but a large Car Wheel interest has succeeded in purchasing 2000 tons for December delivery at \$28, Chicago. This is now the minimum quotation which operators are willing to entertain for the first quarter, and as high as \$28 is asked on car lots in transit. For shipments the last nine months of next year prices are being asked on a lot of 15,000 tons, and several smaller inquiries for Malleable have also come out. That recent Finished Material advances will soon encompass all commodities is indicated by the advance of \$2 on Plates announced by several more Steel companies, and a like in-

crease on Toe Calk and Spring Steel has been made. Accumulated specifications have congested Western Plate mills, and all are likely to follow the lead of Eastern makers in marking up prices. An order for 5000 tons of Cast Iron Pipe has been placed by the Great Northern Railroad, but other large consumers are deferring purchase of 1907 requirements awaiting market developments.

Pig Iron.—Continued offerings of spot Iron and deferred deliveries on many low priced contracts have combined to arouse consumers to question the extremity of the present shortage. The situation is only a repetition of experiences on past bulges, and for the present may be more acute on account of the difficulties that hamper the operators owing to the lack of transportation facilities. In the South the shortage of cars has resulted in the piling of Iron which would otherwise have been shipped and applied on contracts, and on a recent requisition made by a large Birmingham producer for more than 200 cars but 20 were supplied. With the advent of inclement weather the transportation problem will become more involved, and every effort is being made by consumers to accumulate small stocks to provide against further delayed shipments. Among the operators in this district it is the custom not to sell the entire anticipated output over a given period, and it is this tonnage which has been reserved to provide against contingencies that is now finding its way on the market to meet prompt requirements. Many founders are endeavoring to anticipate their deliveries, and in many cases where the requirements have exceeded calculations these requests have been promptly met. Southern No. 2 Foundry Iron in car lots in transit is selling at \$25.90 to \$26.90, Chicago, and Northern grades are held on nearly the same basis. Malleable Bessemer for last half shipment commands \$22.50 to \$24, and for immediate needs \$27 to \$28 is asked. For shipment through the first quarter of the year, quotations, f.o.b. Chicago, are as follows:

Lake Superior Charcoal.....	\$26.00 to \$26.50
Northern Coke Foundry, No. 1.....	26.00 to 26.50
Northern Coke Foundry, No. 2.....	25.50 to 26.00
Northern Coke Foundry, No. 3.....	25.50 to 26.00
Northern Scotch, No. 1.....	26.00 to 27.00
Ohio Strong Softeners, No. 1.....	26.00 to 26.50
Ohio Strong Softeners, No. 2.....	25.50 to 26.00
Southern Coke, No. 1.....	25.40 to 25.90
Southern Coke, No. 2.....	24.90 to 25.40
Southern Coke, No. 3.....	24.40 to 24.90
Southern Coke, No. 4.....	23.90 to 24.40
Southern Coke, No. 1 Soft.....	25.40 to 25.90
Southern Coke, No. 2 Soft.....	24.90 to 25.40
Southern Gray Forge.....	22.40 to 22.90
Southern Mottled.....	21.90 to 22.40
Malleable Bessemer.....	26.00 to 26.50
Standard Bessemer.....	25.30 to 25.80
Jackson Co. and Kentucky Silvery, 6%	27.30 to 27.80
Jackson Co. and Kentucky Silvery, 8%	29.30 to 29.80
Jackson Co. and Kentucky Silvery, 10%	31.30 to 31.80

Metals.—Prices remain practically unchanged and the market is steady, despite the present high basis. Stocks generally are low and all offerings are anxiously taken. We quote: Casting Copper, 23½c. to 24½c.; Lake, 24c. to 24½c., in car lots for prompt shipment; small lots, ¼c. to ¾c. higher; Pig Tin, car lots, 45½c.; small lots, 45½c.; Lead, Desilverized, 6.05c. to 6.15c., for 50-ton lots; Corroding, 6.75c. to 6.85c., for 50-ton lots; on car lots, 2½c. per 100 lb. higher; Spelter, 6.40c.; Cookson's Antimony, 28½c., and other grades, 26½c. to 27½c.; Sheet Zinc is \$8 list, f.o.b. La Salle, in car lots of 600-lb. casks. On Old Metals we quote: Copper Wire, 18½c.; Heavy Copper, 18½c.; Copper Bottoms, 17½c.; Copper Clips, 18c.; Red Brass, 18c.; Red Brass Borings, 14½c.; Yellow Brass, 13½c.; Yellow Brass Borings, 12½c.; Light Brass, 11½c.; Lead Pipe, 5.40c.; Tea Lead, 5c.; Zinc, 5c.; Pewter, No. 1, 26c.; Tin Foil, 34c.; Block Tin Pipe, 27½c.

(By Mail.)

Billets and Rods.—We note the sale of 200 tons of Forging Billets at \$38, f.o.b. Chicago, base, although an Eastern mill has sold 600 tons at considerably above this price. Both Bessemer and Open Hearth Rods are firm at \$35, Pittsburgh, equivalent to \$38, Chicago, and only occasional small lots can be picked up. Practically all of the mills are out of the market on Sheet Bars, the Republic Iron & Steel Company having withdrawn through the entire first half of next year.

Rails and Track Supplies.—The Illinois Steel Company this week announced its withdrawal from the market on Spikes, having sold its entire output for the ensuing year. No important orders have been placed for Standard Section Rails, although an Ohio road is making inquiry for 6000 tons for 1907 shipment. Light Rails remain unchanged in price, despite recent advances announced by the Carnegie Steel Company. Quotations are unchanged as follows: Angle Bars, accompanying Rail orders, 1906 delivery, 1.50c.; car-load lots, 1.75c.; Spikes, 2.25c. to 2.50c., according to delivery; Track Bolts, 2.65c. to 2.75c., base, Square Nuts, and 2.80c. to 2.90c., base, Hexagon Nuts. The store prices on Track Supplies range from 0.15c. to 0.20c. above mill prices. Light Rails, 30 to 45 lb. sections, \$32; 25-lb., \$33; 20-lb., \$34; 16-lb., \$35; 12-lb., \$36, f.o.b. mill. Standard Sections, \$28, f.o.b. mill, full freight to destination.

Structural Material.—Improved specifications are reported by all the mills and the Structural situation generally has greatly improved. Demands of Steel car works and for shipbuilding purposes are larger than ever before at this season of the year, and whatever falling off there has been in the trade of fabricators has been more than made up from other sources. Quotations are unchanged as follows: Beams and Channels, 3 to 15 in., inclusive, 1.86½c.; Angles, 3 to 6 in., ¼-in. and heavier, 1.86½c.; larger than 6 in. on one or both legs, 1.96½c.; Beams, larger than 15 in., 1.96½c.; Zees, 3 in. and over, 1.86½c.; Tees, 3 in. and over, 1.91½c., in addition to the usual extras for cutting to extra lengths, punching, coping, bending and other shop work.

Plates.—More Steel companies this week announced an advance of \$2 a ton on both Sheared and Universal Plates, and the indications are that the remaining mills will soon follow the lead of the Eastern manufacturers with a similar increase in price. The Universal mills are crowded with work from the car companies, while on Sheared Plates nearly all the makers are unable to make shipments in less than 60 days. Quotations are revised as follows: Tank Plates, ¼-in. and heavier, wider than 6½ and up to 100 in. wide, inclusive, car lots, Chicago, 1.76½c. to 1.86½c.; 3-16 in., 1.86½c. to 1.96½c.; Nos. 7 and 8 gauge, 1.91½c. to 2.01½c.; No. 9, 2.01½c. to 2.11½c.; Flange quality, in widths up to 100 in., 1.86½c. to 1.96½c.; base, for ¼-in. and heavier, with the same advance for lighter weights; Sketch Plates, Tank quality, 1.86½c. to 1.96½c.; Flange quality, 1.96½c. Store prices on Plates are as follows: Tank Plate, ¼-in. and heavier, up to 72 in. wide, 2c. to 2.10c.; from 72 to 96 in. wide, 2.10c. to 2.20c.; 3-16 in., up to 60 in. wide, 2.10c. to 2.20c.; 72 in. wide, 2.35c. to 2.45c.; No. 8 up to 60 in. wide, 2.15c. to 2.25c.; Flange and Head quality, 0.25c. extra.

Bars.—Since the advance on Steel Bars, Iron has become more active, and as it can still be purchased below the basis of 1.60c., Pittsburgh, a few consumers are preferring the latter to Steel. At Pittsburgh sales of Steel have been reported at 1.65c., but nothing better than 1.60c. can be done in this market regardless of delivery. The output of the Illinois Steel Company has been sold for practically a year, and deliveries on nearly all sizes of Steel are deferred for three months. Quotations are unchanged, as follows: Iron Bars, 1.71½c. to 1.76½c.; Steel Bars, 1.76½c., both half extras; Hoops, 2.16½c., extras as per Hoop card; Bands, 1.76½c., as per Steel card; Soft Steel Angles and Shapes, 1.66½c., half extras. Store prices are as follows: Bar Iron, 2.10c. to 2.25c.; Steel Bars, 2c. to 2.10c.; Steel Bands, 1.95c. to 2.05c., half extras; Soft Steel Hoops, 2.35c. to 2.45c., full extras.

Sheets.—There has been practically no improvement in deliveries of both Black and Galvanized Sheets, and consumers are compelled to wait from 30 to 60 days. Concessions of \$1 a ton, which prevailed immediately after the recent advances, have been withdrawn, the increased cost of Sheet Bars, as shown by the recent monthly adjustment, having made it unprofitable for manufacturers not controlling their raw material supply to shade the official prices. Quotations are therefore firmly maintained as follows: Blue Annealed, No. 10, 1.96½c.; No. 12, 2.01½c.; No. 14, 2.06½c.; No. 16, 2.16½c.; Box Annealed, Nos. 17 to 21, 2.51½c.; Nos. 22 to 24, 2.56½c.; Nos. 25 and 26, 2.61½c.; No. 27, 2.66½c.; No. 28, 2.76½c.; No. 29, 2.86½c.; No. 30, 2.96½c.; Galvanized Sheets, Nos. 10 to 14, 2.71½c.; Nos. 15 and 16, 2.91½c.; Nos. 17 to 21, 3.06½c.; Nos. 22 to 24, 3.21½c.; Nos. 25 to 26, 3.41½c.; No. 27, 3.61½c.; No. 28, 3.81½c.; No. 30, 4.31½c. Sheets from store, Blue Annealed, No. 12, 2.25c.; No. 14, 2.30c.; No. 16, 2.40c.; Box Annealed, Nos. 18 to 21, 2.70c.; Nos. 22 to 24, 2.75c.; No. 26, 2.80c.; No. 27, 2.85c.; No. 28, 2.95c.; No. 30, 3.35c.; Galvanized from store, Nos. 10 to 20, 3.20c. to 3.25c.; Nos. 22 to 24, 3.45c. to 3.50c.; No. 26, 3.55c. to 3.60c.; No. 27, 3.65c. to 3.85c.; No. 28, 4.00c.; No. 30, 4.45c. to 4.60c.

Merchant Pipe.—Manufacturers are suffering from the Skelp shortage, and Pipe shipments are consequently greatly delayed, especially on the larger sizes. The open weather which continues to prevail throughout the West has permitted building operations to be carried on without interruption, and the demands from this source have kept jobbers' stocks at a low ebb. Discounts on car lots, Chicago, are as follows: Black Steel Pipe, 77.35, on the base sizes, ¾ to 6 in., and Galvanized, 67.35. From store in small lots Chicago jobbers quote 74½ to 75 per cent. on Black Steel Pipe, ¾ to 6 in. Iron Pipe is held at an advance of 4 to 5 points above these prices.

Boiler Tubes.—Anticipating a further advance, distributors and consumers are buying freely, although none of the makers has yet indicated that higher prices would soon be announced. Skelp shortage still interferes with manufacturing operations, and shipments are gradually being further deferred. Mill quotations are as follows on base sizes, 2½ to 5 in., in carload lots: Steel Tubes, 68.35; Iron, 55.35; Seamless, 50.35; 2½-in. and smaller and lengths over 18 ft., and 2½ in. and lengths over 22 ft., 10 per cent. extra. Store prices are unchanged, as follows:

	Steel.	Iron.	Seamless.
1 to 1½ in.	40	35	42½
1½ to 2½ in.	50	35	35
2½ in.	52½	35	30
2½ to 5 in.	60	47½	49½
6 in. and larger	50	35	..

Cast Iron Pipe.—The Great Northern Railway Company this week purchased 5000 tons of Cast Iron Pipe for 1907 delivery from the United States Cast Iron Pipe & Foundry Company. Other roads are likewise figuring on their next year's requirements, although present prices are considered too high by some to warrant buying so far in the future. We quote: Water Pipe, 4-in., \$36; 6, 8, 10 and 12 in., \$34.50; over 12-in., \$34, with \$1 extra for Gas Pipe.

Merchant Steel.—Following the advances announced last week higher prices have been put into effect on Toe Calk and Railway Spring Steel, which are now on the basis of 2.31½c. and 1.96½c., Chicago, respectively. Specifications for all grades of Merchant Steel show no diminution and are still in excess of production. Quotations are revised as follows: Planished or Smooth Finished Tire Steel, 1.90½c.; Iron Finish, up to 1½ x 1½ in., 1.91½c.; Iron Finish, 1½ x 1½ in. and larger, 1.76½c., base; Channels for solid rubber Tires, ¾ to 1 in., 2.26½c., and 1½-in. and larger, 2.16½c.; Smooth Finished Machinery Steel, 2.01½c.; Flat Sleigh Shoe, 1.71½c.; Concave and Convex Sleigh Shoe, 2.06½c.; Cutter Shoe, 2.35c.; Toe Calk Steel, 2.31½c.; Railway Spring, 1.96½c.; Crucible Tool Steel, 6½c. to 8c., and still higher prices are asked on special grades. Shafting, 50 per cent. off in car lots and 45 per cent. in less than car lots, in base territory.

Coke.—By-product operators, both in this city and Milwaukee, have disposed of their entire output practically through the entire first half of next year, and are unable to accept orders for immediate shipment. Only an occasional car of Connellsburg Coke is to be had, although the supply of Virginia grades has improved in the past week. We quote by-product and Connellsburg grades at \$6.65, Chicago, and Virginia at \$6.25.

Old Material.—Owing to the small offerings of both Old Iron Rails and Axles it is extremely difficult to locate the market, and quotations given below are merely nominal. Car Wheels continue their upward march, sales having been made this week on the basis of \$24.25, Chicago. The railroad offerings of Wheels are extremely light, owing to the practice which prevails in the trade of returning one Old Wheel to the foundry for every new Wheel furnished. Naturally the number of new Wheels that are being produced is greatly in excess of the replacements, the car works having no Old Wheels to offer in exchange. The Heavy Melting Steel market is quiet, as both the Inland Steel and Grand Crossing track companies are out of the market for the present. Cast Scrap is active, however, as a result of increased foundry requirements, but prices are practically unchanged. The Chicago, St. Paul & Omaha Railroad has issued a list consisting of 1200 tons of material, this being the only offering of the week. Quotations on gross tons, car lots, f.o.b. Chicago, are as follows:

Old Iron Rails.....	\$28.00 to \$29.00
Old Steel Rails, 4 ft. and over.....	21.50 to 22.00
Old Steel Rails, less than 4 ft.....	20.50 to 21.00
Heavy Relaying Rails, subject to Inspection, 50 lb. and under.....	29.00 to 31.00
Old Car Wheels.....	24.00 to 24.50
Heavy Melting Steel Scrap.....	17.50 to 18.00
Frogs, Switches and Guards.....	18.00 to 18.50
Mixed Steel.....	15.00 to 15.50

The following quotations are per net ton:

Iron Fish Plates.....	\$23.00 to \$23.50
Iron Car Axles.....	27.50 to 28.00
Steel Car Axles.....	23.50 to 24.00
No. 1 Railroad Wrought.....	17.50 to 18.00
No. 2 Railroad Wrought.....	16.50 to 17.00
Railway Springs.....	16.00 to 16.50
Locomotive Tires, smooth.....	16.00 to 16.50
No. 1 Dealers' Forge.....	13.50 to 14.00
Mixed Busheling.....	12.50 to 13.50
Iron Axle Turnings.....	11.00 to 11.50
Soft Steel Axle Turnings.....	11.00 to 11.50
Machine Shop Turnings.....	11.00 to 11.50
Cast Borings.....	9.00 to 9.50
Mixed Borings, &c.....	9.00 to 9.50
No. 1 Mill.....	10.50 to 11.00
No. 2 Mill.....	9.50 to 10.00
No. 1 Bollers, cut to Sheets and Rings.....	12.50 to 13.00
No. 1 Cast Scrap.....	17.50 to 18.00
Stove Plate and Light Cast Scrap.....	14.00 to 14.50
Railroad Malleable.....	18.00 to 18.50
Agricultural Malleable.....	17.00 to 17.50

The sales agents of the Tennessee Coal, Iron & Railroad Company and the Republic Iron & Steel Company will hold a meeting at Birmingham, Ala., beginning next Monday, and including trips of inspection to the various plants of the two companies in the Birmingham District.

The Wabash Industrial League, Wabash, Ind., is an organization of the business men of the city, the chief object of which is to induce factories to locate there.

Pittsburgh.

PARK BUILDING, November 28, 1906.—(By Telegraph.)

Pig Iron.—Some fair sized inquiries are in the market for Bessemer Pig for last half of next year's delivery, and to keep prices within bounds and prevent a runaway market the principal sellers are trying to arrange a price of \$21, Valley furnace, for that delivery. It is probable that some tonnage will be closed on this basis within a short time. For reasonably prompt delivery it is held at \$22.50 to \$23, Valley furnace, and the market is correctly represented by the lower price. A sale of 1000 tons for December shipment was made on the basis of \$22.75, Valley furnace. Some very small lots for prompt shipment have sold at higher figures, but these small sales do not correctly represent the actual market. We note a sale of 3000 tons of Basic for first half of next year at \$21.80 at furnace, and 3600 tons for third quarter delivery at \$21. A local interest has bought 4500 tons of Basic for first half of the year delivery at \$21.50, Valley furnace. There is but little doing in Foundry Iron, only a few small lots having been sold for prompt shipment, bringing \$24.50 to \$25 at furnace. We quote Northern No. 2 Foundry for first quarter delivery at \$23, Valley furnace. A sale of 1000 tons of Forge Iron for prompt delivery is reported at \$24 at furnace, but we have not been able to verify this sale. Northern Forge Iron for first half of the year delivery is held at about \$22, Valley furnace.

Steel.—Bessemer and Open Hearth Billets seem to be getting scarcer than ever, and bring for prompt delivery practically any price that sellers care to ask. We quote Bessemer Billets at \$29.50 to \$30, and Open Hearth \$32 to \$32.50, Pittsburgh; Sheet and Tin Bars in random lengths \$29.50 to \$30, with 50c. a ton advance for Cut Bars.

(By Mail.)

New business in all kinds of Finished Iron and Steel continues to be received by the mills in enormously heavy volume, and the chief trouble in the whole market is to get deliveries of material. There is probably not a single concern in the Iron and Steel business to-day that is not over-sold on nearly everything it makes and is back on deliveries. How long the present condition is going to continue is a question, but it seems absolutely assured for the first six months of the year at least. Local makers of Plates have followed the action of the Eastern mills in advancing prices \$2 a ton, and the minimum of the market is now 1.70c., Pittsburgh. There has not been much Pig Iron sold the past week, but there is a fair amount of inquiry, consumers having trouble in placing contracts with any promise of deliveries. There would be no trouble in disposing of Bessemer and Basic Iron for prompt delivery at \$22.50, Pittsburgh, but it is a question where sellers could be found that would accept this price. Small lots of Bessemer for prompt delivery have sold at a higher figure. The scarcity in supply of Bessemer and Open Hearth Billets seems to be getting worse, and it is probable that Bessemer Billets for prompt delivery would bring upward of \$30, and Open Hearth \$32, Pittsburgh. The efforts of the large interests are still being concentrated in trying to hold prices in check and prevent a runaway market. With the demand for everything much heavier than the actual supply, it looks a little dubious whether this can be done. It is recognized that on some lines prices are already too high to maintain a healthful condition, but these have been brought about by the extraordinary demand for practically all kinds of Iron and Steel, which is simply beyond the capacity of the mills.

Ferromanganese.—The market continues very strong, and there is a good deal of inquiry, particularly for prompt delivery. We quote 80 per cent. Ferro for prompt delivery at \$85 to \$87.50, and for forward delivery at \$80 to \$82.50, Pittsburgh.

Wire Rods.—Prices on Wire Rods are practically anything that sellers care to ask, as they are very scarce. We quote Bessemer Rods at \$37, and Open Hearth at \$38, Pittsburgh, but it is probable that even higher prices would be paid by consumers if sellers would agree to make reasonably prompt shipment. The Pittsburgh Steel Company and the American Steel & Wire Company are the principal producers of Wire Rods, but neither has sold any Rods in the open market to speak of for a long time.

Muck Bar.—The market continues strong, the demand being active and the supply limited. It is probable that best grades of Muck Bar, made from all Pig Iron, would bring about \$37, while Bar made from part Scrap is held at \$34 and higher.

Skelp.—There is some inquiry for Skelp, but consumers find great trouble in placing orders with mills that can make deliveries wanted, as practically all makers have their output sold up for several months. Prices are firm, and we quote: Grooved Steel Skelp, 1.65c. to 1.70c.; Sheared Steel Skelp, 1.70c. to 1.75c.; Grooved Iron Skelp, 1.75c. to 1.80c.; Sheared Iron Skelp, 1.85c. to 1.90c., Pittsburgh, these prices depending on widths and gauges.

Steel Rails.—Orders for Rails for 1907 delivery have been active the past week, the Carnegie Steel Company entering contracts for nearly 60,000 tons, among which was 5000 tons for the Texas & Pacific. The demand for Light Rails is not as active as it was, many buyers having covered their requirements before the recent advance in prices was made. The Carnegie Company is sold up on both Standard and Light Rails for some months into next year. We quote Light Rails as follows: 20 to 45 lb., \$32; 16-lb., \$33, and 12-lb., \$34, at mill. Standard Sections remain at \$28, at mill.

Structural Material.—The advance of \$2 a ton in prices of Steel Bars and Plates is taken by the trade as foreshadowing a similar advance in prices of Structural Steel, and for this reason the demand the past week or two has been unusually heavy, the large trade which carries heavy stocks desiring to contract before prices are advanced. A tremendous amount of work is in sight, but much of this will not come up before next year. While the Structural mills are not actually in need of specifications, it is a fact that orders have not been as plentiful as in the summer and early fall. Prices are firm and we quote: Beams and Channels, up to 15-in., 1.70c.; over 15-in., 1.80c.; Angles, 3 x 2 x $\frac{1}{4}$ in. thick up to 6 x 6 in., 1.70c.; 8 x 8 and 7 x 3 $\frac{1}{2}$ in., 1.80c.; Zees, 3-in. and larger, 1.70c.; Tees, 3-in. and larger, 1.75c. Under the Steel Bar card Angles, Channels and Tees under 3-in. are 1.60c., base, for Bessemer and Open Hearth, subject to half extras on the Standard Steel Bar card.

Plates.—The situation in Plates has reached that stage where large interests like the Carnegie Steel Company, Jones & Laughlin Steel Company and others are so congested with tonnage that they have decided that on any more orders they may conclude to accept, and on which deliveries are specified, prices will be on the basis of 1.70c., Pittsburgh, or an advance of \$2 a ton over quotations heretofore made by them. Some of the Eastern mills took the initiative some weeks ago and independently advanced prices on Plates \$2 a ton, and this action has now been followed by local makers. The engagements of the Carnegie Steel Company on Plates with the Steel car interests, the lake boat builders and other consumers are so heavy that this company is practically sold up on all the Plates it can make in the first half of 1907. Other Plate mills are about as badly congested with tonnage, and with the higher prices of labor, Pig Iron and Steel, this advance of \$2 a ton in Plates is a natural result. We have advanced our prices \$2 a ton and now quote: Tank Plates, $\frac{1}{4}$ in. thick, 6 $\frac{1}{4}$ in. up to 100 in. in width, 1.70c., base, at mills, Pittsburgh. Extras over this price are as follows:

	Extra per 100 lb.
Gauges lighter than $\frac{1}{4}$ -in. to and including 3-16-in.	
Plates on thin edges.....	\$0.10
Gauges Nos. 7 and 8.....	.15
Gauge No. 9.....	.25
Plates over 100 to 110 in.....	.05
Plates over 110 to 115 in.....	.10
Plates over 115 to 120 in.....	.15
Plates over 120 to 125 in.....	.25
Plates over 125 to 130 in.....	.50
Plates over 130 in.....	1.00
All sketches (excepting straight taper Plates varying not more than 4 in. in width at ends, narrowest end being not less than 30 in.).....	.10
Complete Circles.....	.20
Boiler and Flange Steel Plates.....	.10
"A. B. M. A." and ordinary Firebox Steel Plates.....	.20
Still Bottom Steel.....	.30
Marine Steel.....	.40
Shell Grade of Steel is abandoned.	

TERMS.—Net cash 30 days. For anticipated payments a maximum discount may be allowed at the rate of 6 per cent. per annum and for a longer time than 30 days interest shall be charged at the same rate per annum. Invoices paid within ten days from date thereof, discount of $\frac{1}{2}$ of 1 per cent. is allowable. Pacific Coast base 1.60c., f.o.b. Pittsburgh, with all rail tariff rate of freight to destination added, no reduction for rectangular shapes 14 in. wide down to 6 in. of Tank, Ship or Bridge quality.

Sheets.—The demand for both Black and Galvanized Sheets is not as active as it was, but the mills rather welcome this as it will give them a chance to catch up on deliveries on which they are anywhere from four weeks to three months or longer behind. Stocks held by jobbers are light and they find trouble in keeping anything like a full assortment of gauges and sizes. We are advised that some mills continue to ask premiums of at least \$1 a ton for reasonably prompt deliveries. We quote: Blue Annealed Sheets, No. 10 gauge and heavier, 1.80c.; Nos. 11 and 12, 1.85c.; Nos. 13 and 14, 1.90c.; Nos. 15 and 16, 2c.; Box Annealed, Nos. 17 to 21, 2.35c.; Nos. 22 to 24, 2.40c.; Nos. 25 and 26, 2.45c.; No. 27, 2.50c.; No. 28, 2.60c.; No. 29, 2.75c.; No. 30, 2.85c. We quote Galvanized Sheets as follows: Nos. 10 and 11, 2.55c.; Nos. 12 and 14, 2.65c.; Nos. 15 and 16, 2.75c.; Nos. 17 to 21, 2.90c.; Nos. 22 and 24, 3.05c.; Nos. 25 and 26, 3.25c.; No. 27, 3.45c.; No. 28, 3.65c.; No. 29, 3.90c., and No. 30, 4.15c. We quote No. 28 Gauge Painted Roofing Sheets at \$1.85 per square, and Galvanized Roofing Sheets, No. 28 gauge, \$3.15 per square for 2-in. corrugations. These prices are for carload lots, jobbers charging the usual advances for small lots from store.

Hoops and Bands.—A moderate tonnage of new business is being placed, but the mills are running mostly on contracts entered before the recent advance in prices, being filled up with orders for some months. The market is firm and we quote: Steel Hoops, 2c., and Bands for all purposes at 1.60c., base, half extras, as per Standard Steel card. These prices are for carload lots, f.o.b. Pittsburgh, plus full tariff rail rate to point of delivery, an advance of \$2 a ton being charged for less than carloads.

Tin Plate.—Some heavy orders for Bright Plate from the Canning interests have been placed in the last week or two, deliveries in some cases extending into third quarter of next year. All the mills have an enormous tonnage on their books for delivery through the first half of next year, and also for delivery into third quarter. The continued high prices on Tin Bars and their scarcity, together with the fact that Pig Tin is selling above 43c., are reasons put forth by some in the trade for the belief that another advance in prices of Tin Plate may possibly be made in the near future. The market is strong and we are advised that some orders for Tin Plate for prompt delivery have been taken at a slight premium over official prices. We quote \$3.90 per base box, f.o.b. Pittsburgh, for 14 x 20 100-lb. Cokes, terms 30 days, less 2 per cent. off for cash in 10 days, on which price a rebate of 5c. a box is allowed for carload and larger lots.

Railroad Spikes.—Some of the leading railroads are in the market to place contracts for their entire supply for next year, and a heavy tonnage is under negotiation. All the leading makers of Spikes are sold up for some months, and Spikes for prompt delivery are hard to obtain and bring heavy premiums. We continue to quote on contracts for indefinite delivery from \$2.40 to \$2.50 per 100 lb., while for specified delivery \$2.75 and higher is being frequently paid.

Iron and Steel Bars.—New business in both Iron and Steel Bars is heavy, while specifications on contracts continue to come in freely, and the mills are not able to catch up on deliveries to any extent. Some consumers who usually contract ahead at this season of the year are now in doubt as to whether it is policy to do so, especially on Iron Bars, on account of the high prices ruling. It is not unlikely that some consumers of Iron Bars may go back to Steel, as they can be obtained at about \$4 a ton less than Iron Bars. Local makers of Iron Bars continue to quote at 1.80c. to 1.85c., Pittsburgh, but we are advised that some of the Eastern mills are offering Iron Bars in this market at slightly less than these prices. We quote Steel Bars at 1.60c. to 1.70c., base, half extras, f.o.b. Pittsburgh, depending on deliveries. Iron Bars are 1.80c. to 1.85c., Pittsburgh, and the market is very strong.

Spelter.—There was a sharp decline in prices of Spelter last week, the market having gone off materially. We now quote prime grades of Western Spelter at 6.20c., St. Louis, equal to 6.32 $\frac{1}{2}$ c., Pittsburgh.

Pipes and Tubes.—Some heavy contracts for large Pipe for gas lines have been placed the past week and a heavy tonnage of similar business is pending, but is not far enough along for publication. One outside mill has taken a contract for 120 miles of 10 and 12 in. Pipe for a gas line, while another mill has taken about 3500 tons of large sizes of Pipe for similar purposes. Nothing has been done as yet with the inquiry of the Burmah Oil Company for 270 miles or 10-in. Pipe for Burmah, India. This inquiry was for Iron Pipe, but none of the mills are in position to make it, and if the order is placed it will probably be for Steel Pipe. Reports are that the J. M. Guffey Petroleum Company will build a Pipe line from Indian Territory to Texas, and if this project goes through it means upward of 500 miles of 6 to 8 in. Pipe. The demand for Merchant Pipe from the general trade continues enormously heavy and the mills are congested with tonnage. The extreme discount on Merchant sizes of Steel Pipe is now 70 and 5 per cent. off to the large trade. The official discounts, which are shaded one point or more to the large trade, are as follows:

Merchant Pipe.

	Jobbers, carloads.			
	Steel.	Black.	Galv.	Iron.
	Black.	Galv.	Black.	Galv.
$\frac{1}{2}$ and $\frac{1}{4}$ in.....	70	54	65.5	49.5
$\frac{3}{4}$ in.....	72	58	65.5	57.5
$\frac{1}{2}$ in.....	74	62	73.5	63.5
$\frac{3}{4}$ to 6 in.....	78	68	73.5	63.5
7 to 12 in.....	73	58	69	54
Extra strong, plain ends:				
$\frac{1}{2}$ to $\frac{3}{4}$ in.....	63	51	58.5	46.5
$\frac{3}{4}$ to 4 in.....	70	58	65.5	53.5
$\frac{3}{4}$ to 8 in.....	66	54	61.5	48.5
Double extra strong, plain ends:				
$\frac{1}{2}$ to 8 in.....	59	48	53.5	42.5

Boiler Tubes.—During the week some heavy orders for Locomotive Tubes were placed by several of the leading railroads, who covered their requirements for practically all of next year. A good deal of tonnage is in sight, some of the large consumers evidently believing that it is perfectly safe to contract ahead at present prices. The demand for Merchant Tubes is fairly active and specifications on con-

tracts are coming in freely. Official discounts are being firmly held and are as follows:

Boiler Tubes.

	Iron.	Steel.
1 to 1½ in.	45	50
1½ to 2¼ in.	45	62
2½ in.	50	64
2½ to 5 in.	57	70
6 to 13 in.	45	62

Iron and Steel Scrap.—It is commencing to look like a runaway market on Scrap, and prices have again sharply advanced. Those having Scrap to sell find no difficulty whatever in disposing of it, and in most cases at the highest prices they have obtained in a long time. We are advised that some huge sales of Scrap, particularly Heavy Steel and Wrought Iron Scrap, were made the past week. We have advanced prices on nearly all kinds of Scrap from 50c. to \$1 a ton, and now quote per gross ton, f.o.b. Pittsburgh: Heavy Steel Melting Scrap, \$20 to \$20.50; No. 1 Wrought Scrap, \$21.75 to \$22; No. 2 Wrought Scrap, \$19 to \$19.50; Old Steel Rails, short pieces, 6 ft. and under, for Open Hearth purposes, \$20 to \$20.50; Old Steel Rails, Rerollers, \$22.50 to \$23; Wrought Turnings, \$24 to \$24.50; Low Phosphorus Melting Stock, \$25 to \$25.50; Bundled Sheet Scrap, \$18.25 to \$18.50; Cast Iron Borings, \$13 to \$13.25; Old Car Wheels, \$25; Iron Axles, \$32 to \$33; Steel Axles, \$24 to \$24.50; No. 1 Cast Scrap, \$20 to \$20.50; Railroad Malleable, \$19 to \$19.50; Grate Bars, \$15.50, and Stove Plate, \$16.50.

Coke.—The supply of Coke is getting tighter, and prices are higher. Connellsburg Furnace Coke for prompt shipment has sold at \$3.50 to \$3.60, at oven, and for delivery over first half of next year from \$3.10 to \$3.25 has been paid. Best grades of 72-hr. Connellsburg Foundry Coke have sold at \$4.25 to \$4.50 a ton, at oven. The output of Coke continues enormously heavy, the Upper and Lower Connellsburg regions having made last week a little over 400,000 tons.

Birmingham.

BIRMINGHAM, ALA., November 25, 1906.

Pig Iron.—The past week has been a comparatively quiet one. Inquiries for spot Iron have subsided to a considerable extent and sales for next year have been almost exclusively for second quarter, with a few unimportant contracts extending through the third quarter. The market continues firm and the increased production has as yet had no effect on prices. While some of the producers are still bullish in their talk, the larger interests are opposed to a further advance and are endeavoring to hold the price for second quarter delivery at around \$19. The transportation question is the one absorbing topic this week. Heretofore the foundries in the district have had but little cause for complaint, as owing to their close proximity to the furnaces they have received their Iron in open and "bad order" cars which were unsafe for long hauls, thus enabling them at all times to secure a steady supply of raw material. The situation has, however, been gradually growing worse for several weeks, and the yards of almost every road entering Birmingham are blocked with loaded cars which they are unable to move owing to insufficient motive power. It frequently requires from two to three weeks to get a shipment of Iron from the furnaces less than 5 miles distant, and several Ore mines have been forced to close down this week owing to inability to secure Coal due to congestion of railroad yards. In the meantime larger stocks of Iron are accumulating on the furnace yards, while customers all over the country are clamoring for shipment on contracts. Railroad officials refrain from making any promises whatever, admitting that the business offered is more than they can possibly handle and intimating that the situation may be expected to grow worse instead of improve as the winter approaches. To make matters worse, it is now proposed to advance the rate of freight on Pig and manufactured Iron 25c. per ton, effective February 1, to all points east and north of the Ohio and west of the Mississippi River. This suggestion is meeting with strenuous opposition among the manufacturers here and every influence will be brought to bear to prevent its adoption.

Cast Iron Pipe.—Very little is doing in the way of orders for Pipe just now. The foundries are not anxious to enter new business at present prices, and the buyers hope that something will transpire to reduce rather than advance the price and are consequently not very persistent. All the manufacturers here have plenty of orders to run them for the first few months of next year and are not inclined to take on any more at the present time unless it be gildedged, as the demand in the South next year will be the greatest in its history and this will naturally come to the foundries in this district. One Southern city will contract for 39,000 tons in January. Prices on Water Pipe remain unchanged and are approximately as follows, f.o.b. cars here: 4 to 6 in., \$33; 8 to 12 in., \$32; over 12 in., \$29, with \$1 per ton extra for Gas Pipe.

Old Material.—The demand continues strong and there

is ready sale for all grades. Prices are firm, with dealers' quotations approximately as follows per gross ton here:

Old Iron Rails.....	\$21.50 to \$22.00
Old Iron Axles.....	19.00 to 19.50
Old Steel Axles.....	16.50 to 17.50
Old Car Wheels.....	18.50 to 19.50
No. 1 Railroad Wrought.	19.00 to 19.50
No. 2 Railroad Wrought.	15.50 to 16.00
No. 1 Country Wrought.	15.50 to 16.00
No. 2 Country Wrought.	12.50 to 13.00
Wrought Pipes and Flues.	13.00 to 13.50
Railroad Malleable.....	13.00 to 13.50
No. 1 Steel.....	14.00 to 14.50
No. 1 Machinery Cast.....	15.00 to 15.50
Stove Plate and Light Cast.....	11.00 to 11.50
Cast Borings.....	8.00 to 8.50

Cleveland.

CLEVELAND, OHIO, November 27, 1906.

Iron Ore.—A week ago the statement was made that some charters had been closed for the delivery of Ore in the season of 1907. Those who closed the contracts were mostly small shippers, who were somewhat fearful that there might not be sufficient tonnage to go round next year. The larger shippers are taking the stand that there will be abundant tonnage for all purposes, even without the enormous increase in carrying capacity, which is to be added to the lake fleet during the winter and spring, and further that there will be no change in the carrying charges for next year. Some Ore, to be delivered red at other points than the lower lakes, has been sold f.o.b. upper lake docks at the ruling price on Ore less the last season rate of freight or 75c. from the head of the lakes to Lake Erie. It is apparent now that the railroads in the Northwest are shutting down on the transportation of Ore to the lake docks, and this is having the result of lessening the movement of Ore down the lakes. The check in the movement, however, did not come until it was virtually assured that the total November shipments would reach 4,000,000 tons, assuring 38,000,000 tons for the season.

Pig Iron.—The car shortage in this territory has reached a most aggravated stage and is now a vital influence in the Pig Iron trade. It has been apparent that there has been some justice in the complaints of other shippers that the railroads have discriminated in the matter of car supply in favor of the Iron Ore, Pig Iron and Finished Material trades, since the railroads depend upon those commodities and their rapid movement for an improvement of the car supply. The Pig Iron industry is being crippled to a certain extent by the car supply, especially as pertains to the movement of Southern Iron into this territory. The furnaces here have sold up so far ahead that consumers have been compelled to rely more than ever upon the supply of Iron coming from the South. Furnaces have some stocks there from which sales have been made, but the car shortage delays deliveries to an exasperating extent. This practically precludes the possibility of further sales for spot shipment or first quarter delivery. The Southern furnaces are selling on the basis of \$19, Birmingham, for No. 2 for second quarter delivery, but refuse to quote on material for the last half of next year. Northern No. 2 for spot shipment is selling on the basis of \$25 to \$26 at the furnace, and while there is very little left for sale for first half delivery, the prices hold about the same for that period. There is a good deal of buying for second half. While it cannot be said that there is any large percentage of this material sold for second half delivery, it is nevertheless apparent that a good block of business has been closed. The price is about \$22, Valley Furnace, although some higher prices have been paid and some furnaces are holding for \$23. One sale of 8 per cent. Silicon Iron has been reported at \$32, southern Ohio Furnace, being extremely scarce. Further buying of Basic and Bessemer for second half delivery is reported at \$22, Valley Furnace, spot material being worth about \$25 to \$26, and the same applying on first half delivery.

Finished Iron and Steel.—Due, very largely, to the increased price of Scrap and the strong demand for the finished product, the price of Bar Iron is higher. In fact, the prices recently quoted are said to have left little or no profit for the producer, in view of the high prices prevailing for the raw material. Bar Iron is now selling here on the basis of 1.80c. Pittsburgh, with some mills holding for even higher prices. The mills generally are unable to make prompt shipment, although their condition varies greatly in this particular. Most of the buying of Sheets is now done out of stock, since the mills are at least three months behind their orders, with their condition becoming more congested. The prices out of stock are 2.15c. for No. 10 Blue Annealed; 2.90c. for No. 28 One Pass Cold Rolled, and 3.90c. for No. 28 Galvanized. The smaller mills in the East, which have reserved part of their Plate and Structural Steel capacity for sale at premium prices for prompt shipment, are getting a constantly larger business out of this territory, and the premiums paid are from \$3 to \$5 a ton. Specifications against contracts have been unusually heavy, especially in the lake shipbuilding trade. The demand for Bar Steel is

strong. Prices of Billets vary according to delivery, but Forging Billets are selling at \$35 to \$36, Pittsburgh, for future delivery, the lower price being on 90 days' demand.

Old Material.—The market is still strong, with No. 1 Cast the principal feature. The following are dealers' prices to the trade, f.o.b. Cleveland, per gross ton: Old Steel Rails, \$18 to \$19; Old Iron Rails, \$25.50 to \$26.50; Iron Car Axles, \$23; Heavy Melting Steel, \$18 to \$19 per net ton; Cast Borings, \$10 to \$10.50; No. 1 Busheling, \$15.50 to \$16; No. 1 Railroad Wrought, \$18 to \$18.50; No. 1 Cast, \$21 to \$23; Iron and Steel Turnings and Drillings, \$12 to \$12.50.

Cincinnati.

FIFTH AND MAIN STS., November 28, 1906.—(By Telegraph.)

Pig Iron.—The general situation shows a slight improvement over the week preceding, notably along the line of spot demand. Reports indicate that considerably more spot Iron is available for shipment, which has had the effect of materially reducing the tension in this direction. Inquiry generally is said to be less strenuous, which would indicate that consumers are fairly well supplied for first and second quarters. Some inquiry has developed for third quarter business, which is said to be quotable at \$17.50 Birmingham, for No. 2. The schedule for spot and first half of next year is practically unchanged, with business coming forward in good volume. Shipments from the South during the week have been seriously interfered with on account of the inability of the furnaces to secure cars for loading, and conditions are expected to grow worse as winter approaches. The recent ruling of the railroads not to allow their cars to run beyond their own line necessitated transferring shipments, which of course means delay. The Northern situation shows no improvement, and it appears that as a rule furnaces have little to offer for any delivery before April, and then but a limited tonnage. Quotations of last week are unchanged when Iron is obtainable. We learn of one inquiry for about 2000 tons of Malleable from an Ohio consumer, delivery from May to September inclusive. There is a well defined rumor that another melter in this section bought about 12,000 tons for second quarter delivery, said to have gone at \$17.50 Birmingham. High Silicon Irons are reported strong and in good demand. Freight rates from Hanging Rock district are \$1.15 and from Birmingham \$3. We quote, f.o.b. Cincinnati, as follows:

Southern Coke, No. 1.....	\$26.00 to \$27.00
Southern Coke, No. 2.....	25.00 to 26.00
Southern Coke, No. 3.....	24.00 to 25.00
Southern Coke, No. 4.....	23.00 to 24.00
Southern Coke, No. 1 Soft.....	26.00 to 27.00
Southern Coke, No. 2 Soft.....	25.00 to 26.00
Southern Coke, Gray Forge.....	22.00 to 23.00
Southern Coke, Mottled.....	21.00 to 22.00
Ohio Silvery, 8 per cent.....	29.15 to 29.65
Lake Superior Coke, No. 1.....	25.65 to 26.65
Lake Superior Coke, No. 2.....	25.15 to 26.15
Lake Superior Coke, No. 3.....	24.65 to 25.65

Car Wheel Irons.

Standard Southern Car Wheel.....	\$28.00 to \$28.50
Lake Superior Car Wheel.....	27.00 to 27.50

Coke.—The demand continues strong. Prices have advanced over last week's quotations, with shipments fairly satisfactory. We quote the best brands of Connellsville and Virginia Foundry from \$4.15 to \$4.50, f.o.b. ovens.

Finished Iron and Steel.—The market appears to be hardening, while the demand is stronger. Structural Rivets have advanced \$2 per ton, and Boiler Rivets \$1. We quote, f.o.b. Cincinnati, as follows: Iron Bars, in carload lots, 1.88c., with half extras; the same, in smaller lots, 2.10c., with full extras; Steel Bars, in carload lots, 1.73c., with half extras; the same, in smaller lots, 1.95c., with full extras; Base Angles, 1.83c., in carload lots; Beams and Channels, in carload lots, 1.83c.; Plates, $\frac{1}{4}$ -in. and heavier, 1.83c., in carload lots; in smaller lots, 2c.; Sheets, 16 gauge, in carload lots, 2.15c.; in smaller lots, 2.70c.; 14 gauge, in carload lots, 2.05c.; in smaller lots, 2.60c.; Steel Tire, 1 x $\frac{1}{4}$ in. or heavier, 1.93c., in carload lots.

Old Material.—The Scrap market is exceedingly strong and active. Dealers are accumulating no stock, but disposing of all material as rapidly as secured. We quote dealers' prices, f.o.b. Cincinnati, as follows:

No. 1 Railroad Wrought, net ton.....	\$18.50 to \$19.50
Cast Borings, net ton.....	9.50 to 10.50
Steel Turnings, net ton.....	11.50 to 12.50
No. 1 Cast Scrap, net ton.....	16.50 to 17.50
Old Iron Axles, net ton.....	26.50 to 27.50
Old Iron Rails, gross ton.....	25.00
Old Steel Rails, long, gross ton.....	17.50 to 18.50
Relying Rails, 56 lb. and up, gross ton.....	28.50 to 29.50
Old Car Wheels, gross ton.....	18.50 to 19.50
Low Phosphorus Scrap, gross ton.....	19.50 to 20.50

Some Indiana foundries are working only part time on account of inability to get molders. Common labor is also scarce.

Philadelphia.

PHILADELPHIA, PA., November 27, 1906.

The Iron market maintains the extraordinary strength which has been reported for many weeks. Prices of Pig Iron are from \$5 to \$7 a ton beyond what they were during the early summer months, yet there is no cessation of demand and nothing to indicate that the vast requirements of consumers are satisfied. Business is already being done for deliveries during the last half of next year, although sellers are by no means anxious for it even at the comparatively high prices which are now ruling. It might be supposed that makers of Pig Iron would see very little risk in entering orders at such prices and under such conditions, but the experience of the past few months has been such as to shake confidence in any one's judgment. With five or six months' production fully sold ahead it would seem (and many of them feel) that they have got as much business as they ought to carry, but consumers evidently regard the matter from a different standpoint. There is little doubt that consumption during the next few months, and possibly for a longer period, will be on a scale probably unsuspected, under which feeling buyers cannot rest easy until they have a still larger portion of their requirements for 1907 provided for than they now have. There may be, and perhaps there is, an unwarranted amount of optimism which leads buyers to do what they would never think of doing under ordinary conditions, but whether this is so or not, the fact remains that buyers are anxious to increase their lines, even at the high prices now ruling. The question of supply is the all-absorbing topic—price being in some measure a secondary consideration. At around \$25 for Pig Iron it almost takes one's breath, considering the enormous tonnage which is being absorbed, but the trade are beginning to realize that old things are passed away and that the experience of former years seems to have no value. Ultimately there must be a reaction, as in former years, but as to saying what prices will be the limit or what tonnage will be sufficient to turn the scale very few care to venture an opinion at the present time. Apart from the general situation, other problems have to be taken into account. Anything for instance that would interfere with the free movement of materials would be extremely unfortunate at this time, yet even now transportation facilities are taxed to the utmost, while in case of bad weather it is certain that great embarrassment would be more or less felt along the entire line. The receipts of Foreign Pig Iron have thus far made no impression, although they are fully as large as was estimated, with additional cargoes engaged for shipment in late December or early January. These include the Warmland and the Holland, from Middlesbrough to Philadelphia. Reports from abroad also state that 10,000 to 15,000 tons have been engaged for shipment from Glasgow. Although we have no exact data, there is little doubt that it is correct. The closing down of mills and foundries for the Christmas and New Year holidays may enable the furnaces to catch up a little, but at present there are no more signs of it than there were two or three months ago.

Pig Iron.—Prices continue their upward course, all grades except Foreign being from 50 cents to \$1 higher than they were last week. The greatest advance is in Iron for Steelmaking, Basic having sold at \$22.50, and in one or two cases a trifle higher than that. Low Phosphorus has also sold at \$27.50 and looks as though it would advance further in the near future. Foundry grades are about 50 cents dearer, with No. 2X variously quoted at \$24 to \$24.50 for next year's deliveries. The scarcity for prompt shipments may not be quite as great as it has been, but it is still difficult to get 1906 shipments except by paying 50 cents to \$1 and sometimes more than that as premium. Mill Irons are also scarce and about 50 cents higher, although quotations of this grade are very irregular. Foreign Iron is selling at unchanged prices, although the English markets are considerably dearer, and it would be difficult to replace what is here and to arrive at the prices at which they are selling on this side. There does not appear to be any material change in the general outlook, which is exceedingly strong, and consumption appears to be steadily increasing, although in a few instances the difficulty in getting material has cut down product to some extent, but this will probably be overcome in the near future. Sales for January shipment at \$25 for No. 2X Foundry were made yesterday. Prices are about as follows for the first and second quarters of 1907 for deliveries in eastern Pennsylvania territory, subject to 50 cents to \$1 premium for anything that can be had in 1906:

No. 1 X Foundry.....	\$25.50 to \$26.00
No. 2 X Foundry.....	24.00 to 24.50
No. 2 Plain.....	23.50 to 24.00
Standard Gray Forge.....	21.50 to 22.00
Ordinary Gray Forge.....	20.50 to 21.00
Basic.....	22.50 to 22.75
Low Phosphorus.....	27.00 to 27.50
Malleable.....	23.00 to 26.00
Middlesbrough No. 1, on dock.....	22.25 to 22.50
Middlesbrough No. 3, on dock.....	21.50 to 21.75
Scotch, on dock.....	23.75 to 24.00

Ferroalloys.—A considerable business has been done

the past week, and prices are said to be somewhat firmer, although low quotations have been made in some of the recent transactions. Sales have been made for shipments in 1907 at \$72 to \$72.50. Spot stuff is scarce and would bring about \$78 to \$80, and Ferro Silicon \$103 to \$105.

Steel.—There is a very good demand, but it is difficult to place orders, as the mills are crowded with work and have great difficulty in getting out their product quickly enough to meet buyers' requirements. Prices are about the same as last week, namely, \$33 to \$34 for ordinary Rolling Billets, and \$36 to \$40 for Forging Billets.

Plates.—Manufacturers have at last taken the bull by the horns and have advanced their prices \$4 per ton. This has been forced upon them by the advance in Raw Material. The disparity in prices is still somewhat conspicuous, however, as Pig Iron has advanced from \$5 to \$7 per ton, against the very moderate advance of \$4 made on the finished product. These prices may not be official, but they are the prices which buyers have to pay in case they desire to place orders and get satisfactory deliveries—namely:

	Part Carload. Cents.	carload. Cents.
Tank, Bridge and Boat Steel.....	1.93½	1.98½
Flange or Boiler Steel.....	2.03½	2.08½
Marine.....	2.33½	2.38½
Locomotive Firebox Steel.....	2.43½	2.48½
The above are base prices for $\frac{1}{4}$ -in. and heavier. The following extras apply:		
3-16 in. thick.....	\$0.10	
Nos. 7 and 8, B. W. G.....	.15	
No. 9, B. W. G.....	.25	
Plates over 100 to 110 in.....	.05	
Plates over 110 to 115 in.....	.10	
Plates over 115 to 120 in.....	.15	
Plates over 120 to 125 in.....	.25	
Plates over 125 to 130 in.....	.50	
Plates over 130 in.....	1.00	

Structural Material.—There is a fair business under way, but there is little difficulty in getting satisfactory deliveries. The increased capacity for production enables the mills to turn out an enormous tonnage, which has relieved what might otherwise have been a serious situation. Prices are unchanged, as follows: Beams, Channels and Angles, 1.83½c. to 2c., according to specifications.

Bars.—The demand is active at full prices, but in view of the advance in costs manufacturers hesitate in regard to taking large orders. There is plenty of business at 1.83½c. for Best Refined Iron, but present appearances look like higher prices in the near future. Steel Bars are quoted at 1.73½c., but deliveries are hard to get in any reasonable time unless by paying more money.

Sheets.—The demand is good, but prices are unchanged as follows for carload lots and a tenth additional for smaller quantities: Nos. 18 to 20, 2.60c.; Nos. 22 to 24, 2.70c.; Nos. 25 and 26, 2.80c.; No. 27, 2.90c., and No. 28, 3c.

Old Material.—The situation is very peculiar, owing to the diversion of a great deal of material to other markets. New England Scrap is being shipped to Western markets, so that local buyers have to pay more money if they want to get good sized lots. Bids and offers for material delivered in buyers' yards are about as follows:

Steel Crops.....	\$20.00 to \$20.50
No. 1 Steel Scrap.....	19.50 to 20.00
Low Phosphorus.....	24.00 to 24.50
Old Steel Axles.....	24.50 to 25.00
Old Iron Axles.....	32.00 to 32.50
Old Iron Rails.....	27.50 to 28.00
Old Car Wheels.....	23.00 to 23.50
Choice No. 1 R. R. Wrought.....	23.50 to 23.75
No. 1 Yard Scrap.....	21.00 to 21.50
Long and Short.....	19.50 to 20.00
Machinery Scrap.....	20.00 to 20.50
Wrought Iron Pipe.....	17.25 to 17.50
No. 1 Forge F're.....	17.00 to 17.50
No. 2 Light.....	12.00 to 12.50
Wrought Turnings.....	15.75 to 16.25
Axle Turnings.....	17.25 to 17.50
Stove Plate.....	16.75 to 17.25
Cast Borlings.....	13.00 to 13.50
Grate Bars.....	15.00 to 15.50

The German Coal and Iron Markets.

An Interesting Syndicate Adjudication.

BERLIN, November 16, 1906.

The subject of uppermost interest with German Iron and Coal companies at this moment is a decision of the Imperial Supreme Court rendered last week. When the negotiations for the renewal and broadening of the Coal Syndicate were in progress above three years ago great difficulties were encountered from the Iron companies which owned collieries. These were not willing, or were not in position, to accept fixed allotments of Coal production in the Syndicate unless they should be permitted to take out over and above their allotments all the Coal needed for consumption by their furnaces and mills. If they bound themselves to a fixed allotment which included their own consumption they would have made their operations as Iron manufacturers dependent upon the requirements of the Coal trade. It was recognized that Iron companies should be allowed freedom of action in raising Coal for themselves. Hence their collieries were

given an exceptional position through the exemption of Coal for their own use from the Syndicate agreement. On such Coal no dues were to be paid to the Syndicate to defray the expense of its management. These dues now amount to 7 per cent. of the value of the Coal handled by the Syndicate.

This exemption caused a strong impulse among Iron companies to acquire Coal mines, and many consolidations occurred. During this process the question arose whether collieries acquired after the Syndicate contract took effect were relieved from their fixed allotments in it. About two years ago the Deutsch-Luxemburger Company absorbed two Coal mines already in the Syndicate, and claimed the right to take Coal from them for its own use and without paying the Syndicate percentage dues. The Syndicate rejected this claim, and the Iron company brought suit to establish its right to free mining. The case went through various subordinate courts during the past 18 months, where it was in each case decided in favor of the Syndicate. Finally it reached the Supreme Court upon appeal, and it decided for the Iron company.

More Coal and Iron Companies Will Amalgamate.

The decision has created no little consternation among the Coal companies not connected with Iron establishments, since they foresee a rapid acceleration of the amalgamation of Coal mines with Iron companies, which would leave the Coal companies not connected with Iron mines to defray all the expenses of the Syndicate. The latter has had for some months an additional cause for trouble with the Iron companies. Under the pressure of orders for Steel and Iron the companies consumed more and more of their Coal in their own furnaces and no longer supplied the Syndicate with the amounts called for in their allotments. Some weeks ago it was announced that some of the companies were turning over to it only about 40 to 50 per cent. of their allotments, and there was talk that the Syndicate would resort to legal measures to compel the full delivery. Instead of this, however, it went on collecting the percentage dues on undelivered Coal just as if it had been delivered; and under this pressure the Iron companies have so increased their deliveries that none is now more than 8 or 10 per cent. short on deliveries.

What will be the effect of the decision upon the fate of the Syndicate is not yet clear, but the fear has been expressed in various quarters that it will break it up. The Harpener Coal Company, which is one of the biggest of the kind in Germany, holding about 8 per cent. of the total allotments in the Syndicate, has this week announced its intention to make a legal fight to determine the validity of the Syndicate contract on the ground that it was signed under a misapprehension as to its scope. This action is highly significant, since the leading director of the Harpener is also the foremost man in the management of the Syndicate. The Stock Exchange, however, has not taken the projected lawsuit very seriously, Coal shares having even been bulled pretty strongly since this news was published two days ago. The view of brokers evidently is that Harpener is only moving in order to compel an amendment in the Syndicate contract rather than to disrupt it.

The Coal Syndicate Advances Prices.

The Syndicate met last week and voted to advance Coal and Coke prices from the beginning of next April. The advances are mostly 1 mark on Coal, but for coking qualities it is 1.75 marks, while for Coke itself it is 2 marks. The prices are criticised among consumers as going beyond what is justified by the situation. The prices of nearly all grades as just fixed are higher than those reached in the previous great boom; Coke prices, however, are still several marks lower than then.

The Syndicate to-day issued its October report, showing 5,621,000 tons of Coal sold during that month, which compares well with October, 1905, when sales reached 4,955,000 tons. The daily shipments sank, however, below those of September by about 5000 tons. This was due to the shortage of Coal cars, which reached for October 64,783 cars of 10 tons. There was an average shortage of 2510 per day. The situation has grown still worse this month, the latest report showing a lack of 3500 to 4500 cars a day. The railroad authorities are about to open bids for 15,000 new cars, but if the boom continues long it will not be possible for many months to build cars enough to meet the demand. As 20 to 30 new shafts are being sunk on the northern fringe of the Rhenish-Westphalian region, a heavy expansion in Germany's Coal production may be expected within a few years. Will the railroads then be able to cope with a much larger movement of Coal? This question is already troubling the mining interests of the country.

The Iron Trade Still Active.

Conditions in the Iron industry remain much as described in previous letters. The upward movement in prices has not yet exhausted itself. Various sorts of Iron and Steel products have been advanced within the past fortnight, and other advances are projected at an early day. The open market prices on the Düsseldorf Exchange showed pretty general increases at the last fortnightly session. English

Pig, which is now arriving in the Rhenish-Westphalian districts in growing amounts every month, has been advanced 2 marks per ton at Ruhrort, Foundry No. 3 now costing there 78 to 79 marks per ton, according to amounts taken and period of delivery. The arrivals of foreign Pig in October reached 48,200 tons for all Germany, being the largest for any month for some years.

An Essen newspaper states that the Steel Verband had on hand at the middle of October orders reaching a total of 3,686,000 metric tons, or 35 per cent. of the entire allotments for one year. Of this total 1,450,000 tons was for Steel Rails and other railroad construction material, 776,000 for half-finished goods, 710,000 for structural forms, while unclassified orders reaching 750,000 had not yet been allotted to the works. The Verband has for several months been buying Steel abroad with which to fill some of its own orders, chiefly for Belgian customers. These are old orders, taken when prices were considerably lower than they are to-day, and the Verband is losing fully 20 per cent. on them. It has paid out about 480,000 marks in this way the past three months. The management has allowed these details to become public to quiet the clamor of home customers who cannot get Steel as fast as they need it and fancy that the Verband is selling abroad to the detriment of the home market.

Nowhere in the Iron market are there any signs that the boom is approaching its end. On the contrary, buyers have come forward with a rush to place orders at the new prices as detailed in my previous letter. In the Siegen District Pig is frequently loaded warm on the cars, and nowhere are any stocks to be found. Foreign orders for various forms of Iron and Steel products are in the market, but in many cases they do not find takers, and it is said that these buyers will mostly have to turn to England to get their orders filled. Japan is trying to place orders for all sorts of Steel, but the prices offered are too low. That country is also sending here large orders for Nails, which is rather a new thing, as the American market had hitherto supplied Japan. Japan and Argentine both send large contracts for Piping. France is increasing its taking of Bessemer Iron. Canada and Japan are asking for rather large amounts of rolling mill products, especially Plates. Large amounts of Foundry Iron have been loaded for "North America," as the market reports have it, and it is not clear whether Canada or the United States is meant.

Germany's imports of machine tools for the first nine months of 1906 amounted to 6554 tons, as compared with 3954 tons during the like period of 1905. Imports from the United States rose from 2243 to 4503 tons. Over two-thirds come from the United States. Germany's exports of these goods rose at the same time from 23,937 to 30,069 tons.

The Ernst Schiess machine tool shops at Düsseldorf have been converted into a joint stock company, with a capital of 3,300,000 marks. Commerzienrat Schiess holds nearly all the stock.

The new furnace company at Lübeck, whose works will be put in operation within the next six or eight months, has just voted to increase its capital by 2,000,000 marks. Very favorable prognostications are made for the company, and its stock, not yet listed on any stock exchange, has already reached a price of 130 marks.

The Verein Deutcher Eisenhüttenleute will hold its next meeting at Düsseldorf December 9, with a highly interesting programme. Papers will be read on progress in the production of Steel by the electrical method and on the first electrically driven reversible rolling mill recently put into operation in Austrian Silesia. The meeting will also celebrate the twenty-fifth anniversary of the secretaryship of Dr. Schroedter.

New York.

NEW YORK, November 28, 1906.

Pig Iron.—During the week from 9000 to 10,000 tons of Middlesbrough Foundry Iron, afloat, have been sold in this market, and inquiries are now in hand for deliveries of Pig Iron during the third and fourth quarter. Both domestic and foreign Irons have been advanced, and so far as Scotch Iron is concerned good brands are not available for shipment before the middle of January. Basic Pig Iron has been bought quite freely, and an aggregate of 7000 to 8000 tons has been marketed for next year's shipment at \$23, delivered. We quote Scotch, ex-ship, \$24.50 to \$25, duty paid, for No. 1. No. 1 Middlesbrough is quoted at \$23 to \$23.50, ship, and No. 3 at \$22.50 to \$23 for forward delivery. We quote for Northern Irons for delivery during the first half, \$26 to \$26.50 for No. 1 Foundry, \$24.50 to \$25 for No. 2 Foundry and \$24 to \$24.50 for Plain, at tidewater.

Steel Rails.—Among orders entered in the past week are 5000 tons for the International & Great Northern ("Texas Railroad"), 2500 tons for the Detroit, Flint & Saginaw, 2000 tons for the Delaware & Magnetic Springs and 1000 tons for the Milwaukee & Northern. The bookings for next year are now estimated at something over 2,000,000 tons. There are

indications that the amount carried over to 1907 will not be as large as was anticipated, the mills having made remarkable records of output.

Structural Material.—The American Bridge Company's total business for November is estimated at 40,000 tons, making this one of the lightest months of the year. The business of the past week includes a large tonnage for Steel Corporation work in the Pittsburgh District, estimated at about 15,000 tons, the greater portion being for extensions at Duquesne. More Steel is yet to be let for Pittsburgh District improvements. Another San Francisco contract has been placed, the Moore Building, requiring 850 tons of Steel. In New York City the Consolidated Exchange Building, 300 tons, has been let in the week. It is understood that the greater part of the 7500 tons of bridge work for the South & Western Railroad will go to the Pennsylvania Steel Company. The King Bridge Company, Cleveland, is also expected to participate in this contract. Building is still quite active at a number of points, the work recently figured on including contracts at Mobile and Chattanooga, and at Cleveland, Ohio. In the latter city one building calls for 1300 tons, and there will be a large order for Steel work on the Government building. The Orford Copper Company is letting the construction of a new building at Bayonne, N. J., requiring 900 tons of Steel. At Fall River, Mass., a highway bridge consisting of two 100-ft. spans and a Scherzer lift is being figured on, calling for about 2500 tons of Steel. Some of the smaller bridge companies are bidding more keenly for the work now being given out. The capacity of the bridge and Structural works of the country, leaving out small local fitting shops, is estimated at about 1,800,000 tons, which is considerably beyond the total of work given out even in such a year as 1906. A good many contracts are beyond the ability of the smaller works, but the line between what they are able to undertake and contracts for which only the larger works are equipped is not always drawn in bidding. The Structural mills have had quite a little call recently for early shipment of material for work that must be hurried to completion before severe weather sets in. While in general the mills are easier than they were in the summer months, and are not booked so far ahead, the amount of work coming up week by week still preserves a strong situation. We continue our quotations on mill shipments for tidewater deliveries as follows: Beams, Channels, Angles and Zees, 1.84½c.; Tees, 1.89½c.; Bulb Angles and Deck Beams, 1.99½c. On Beams 18 to 24 in. and on Angles over 6 in. the extra is 0.10c. Sales out of stock of material cut to length are made at 2¼c. to 2½c.

Bars.—The Eastern Bar Iron manufacturers held a conference in this city on Thursday of last week, and decided to advance the official base to 1.60c., Pittsburgh, thus putting it on the level with the official price of Steel Bars. No sales, however, are being made at the official Bar Iron price, but quotations range from 1.84½c. to 1.89½c., tidewater, with probably three-fourths of the mills getting the higher rate. While the demand for Bar Iron is excellent, and the market is as strong as at any time in the recent past, the disparity between 1.84½c. for Bar Iron and 1.74½c. for Steel Bars is diverting to Steel some trade which ordinarily belongs to the Bar Iron manufacturers. It is stated that deliveries of Steel Bars can be made about as early as of Bar Iron.

Wire Rods.—The Shenandoah Steel Wire Company, Buffalo, N. Y., has placed an order with the Morgan Spring Company, Youngstown, Ohio, for 10,000 tons of No. 5 Bessemer Steel Wire Rods.

Plates.—All manufacturers of Plates in a position to make reasonably early delivery have advanced their prices, and are now quoting \$2 per ton on all grades above the prices quoted by them two weeks ago. The advance has not checked business, but both orders and inquiries continue to demonstrate the good condition of the consuming end of the trade. Quotations are as follows, at tidewater, for carload lots: Sheared Tank Plates, 1.84½c. to 1.94½c.; Flange Plates, 1.94½c. to 2.04½c.; Marine Plates, 2.24½c. to 2.34½c.; Firebox Plates, 2.34½c. to 2.70c., according to specifications.

Cast Iron Pipe.—Some important transactions have occurred the past week. The Brooklyn Union Gas Company purchased about 3000 tons for spring delivery, dividing its purchases among three foundries and paying something over \$36 per ton for 6-in. The American Pipe Mfg. Company purchased 4000 to 5000 tons of Water Pipe for delivery at Norfolk, Va. The Consolidated Gas Company of this city is in the market for 6000 tons of Gas Pipe, and the New England water works people are coming in for their usual season purchases. The latter interests have not usually placed orders for their year's supplies until March. The demand for next year's delivery, however, is increasing steadily and prices are growing stronger. It is possible that purchases for late spring delivery may be effected at \$34.50 per net ton at tidewater for 6-in. from some founders, but this appears to be the absolute minimum.

Old Material.—The situation is considerably stronger at this time than at the date of last report. Holders of many classes of material appear to be more desirous of

keeping their stock than selling it. The demand for Foundry stock is getting even more intense, Cast Scrap leading everything else in both volume of business and strength of prices. Old Car Wheels are eagerly sought. Railroad Wrought and Yard Wrought have experienced an improved demand and the trade in these particular lines is much better. Heavy Melting Steel Scrap is selling better in all other markets than in eastern Pennsylvania, the demand increasing from such sources. Some consumers are offering to pay more now than they were willing to give last week. Eastern Pennsylvania Steel Scrap consumers are bidding so much less than can be secured in other territory that not much effort is being made just now to effect sales there. While the rolling mills in eastern Pennsylvania have also been conservative in purchasing stock, the demand in that section both for Busheling and Puddling material has improved and is now considerably better than for several weeks, while the demand for such stock from other sections is a great deal more active. The outlook from the dealers' standpoint is steadily growing more favorable and a confident feeling obtains that prices will see still higher levels. Approximate prices for New York and vicinity per gross ton are as follows:

Old Iron Rails	\$24.50 to \$25.00
Relaying Rails	28.00 to 29.00
Old Steel Rails, rerolling lengths.....	18.50 to 19.00
Old Steel Rails, short pieces.....	16.25 to 16.75
Heavy Melting Steel Scrap.....	16.25 to 16.75
Standard Hammered Iron Car Axles	29.00 to 30.00
Old Steel Car Axles	21.50 to 22.50
No. 1 Railroad Wrought	21.00 to 21.50
Iron Track Scrap	18.00 to 18.50
No. 1 Yard Wrought, long.....	18.50 to 19.00
No. 1 Yard Wrought, short.....	18.00 to 18.50
Wrought Pipe	14.50 to 15.00
Light Iron	10.00 to 11.00
Cast Borings	10.00 to 11.00
Wrought Turnings	13.00 to 14.00
Old Car Wheels	21.00 to 22.00
No. 1 Machinery Cast	18.00 to 19.00
Stove Plate	14.50 to 15.00
Grate Bars	13.50 to 14.00
Malleable Cast	18.00 to 19.00

Metal Market.

NEW YORK, November 28, 1906.

Pig Tin.—The price has advanced steadily during the week, but with the exception of Friday business was of small volume. Thursday sales were made at 42.85c.; on Friday business was done at 43.12½c. early in the afternoon, but afterward sales were made for later deliveries at 42.25c. The reason for the sharp upturn was the announcement that there would be none of the Atlantic Transport Company's steamers leaving London on November 29. As this company carries the bulk of Tin from London there will be but little metal reaching this country from that port in the first half of December. There are reports of heavy buying in London for American account the last three weeks, and there has also been considerable inquiry in London for Eastern metal carrying American freight options. Indications are not wanting that the leading consuming interest has been buying considerable metal in London. The Banca sale will be held in Amsterdam, Holland, Thursday, and will consist of about 1700 tons. It would not be contrary to custom if the London market should advance sharply after this sale. To-day's price is higher in New York at 43.40c. The London market closed higher to-day at £198 7s. 6d. for spot and £198 12s. 6d. for futures. The arrivals so far this month are good, amounting to 3149 tons, and there are afloat for American ports 2585 tons.

Copper.—Prices are higher for future deliveries, and there is but little Copper to be had for prompt shipment, so all these prices are largely nominal. Sales of Electrolytic for November, December and January delivery have been made at 22.50c., and some are holding out for 22.75c. Lake has been sold at 23c. in wholesale lots. The London market closed to-day at £101 15s. for spot, and £102 15s. for futures, with Best Selected held at £107. The export trade is most excellent, and the German Copper trade is unusually active, the extent of this being clearly shown by the exportation of 15,306 tons so far this month. There seems to be no curtailment of domestic consumption; on the contrary, an increase is made in some lines. The manufacturers of Rolled Copper Sheets are particularly active, and the demand is in excess of the supply. Estimates are now being made of the probable production in 1906, and it seems to be the consensus of opinion that the American increase will be slight, the highest estimate being about 10 per cent. increase over 1905. In foreign countries, however, the increase will be more particularly in some South American States.

Pig Lead.—The Lead market is strong. The principal producer is out of the market as far as this year's deliveries are concerned. There is little or no spot Lead in carloads, and such as there is for December delivery is held at 6c. New York. In St. Louis the price continues firm at 5.87½c. No relief can be expected from Europe as long as the present price of £19 5s. continues in London.

Spelter.—The decline last week had the effect of shaking out weak holders and now prices are higher than before. The New York market is quoted at 6.40c. to 6.50c. and St. Louis at 6.30c. to 6.35c. We learn of sales of prime Western brands at several points higher than the foregoing New York prices.

Antimony.—Cookson's can be had at 28c., Hallett's at 25c. and outside brands at 24½c. to 25c. The market is exceptionally firm, especially for future positions, and no Hallett's can be had from Europe before January. It is reported that Cookson's is not to be had from Europe before April, and that sales have been made for that delivery at 25.50c.

Ferroalloys.—January deliveries of Ferrosilicon can be had in some quarters at \$104 per ton, on dock; December cannot be had under \$106. All European makers are behind on shipments. Ferromanganese appears to be easier, and we learn of sales at \$78, f.o.b. cars. Ferrochrome is unchanged at \$150 basis.

Nickel.—Prices are without change at 45c. for ton lots and 55c. to 60c. for smaller quantities.

Tin Plates.—There is a good demand at the unchanged price of \$4.09 for 100-lb. Coke Plates, f.o.b. New York, and \$3.90, f.o.b. Pittsburgh. Foreign Tin Plate is very active, the price on 20 x 14 having advanced 10½d. during the week to 15s. 3d. Oil Plates, 18¾ x 14, are held at 15s. 1½d. Welsh makers are handicapped by the shortage of bars, and being unable to import any from the United States, as is the usual custom, prices have advanced about 8s. per ton to £6.

Old Metals.—The demand continues to exceed the supply and dealers are asking the following prices:

	Cents.
Copper, Heavy Cut and Crucible	21.00 to 21.50
Copper, Heavy and Wire	20.50 to 21.00
Copper, Light and Bottoms	18.75 to 19.00
Brass, Heavy	15.00 to 15.50
Brass, Light	12.00 to 12.50
Heavy Machine Composition	19.00 to 19.50
Clean Brass Turnings	13.75 to 14.25
Composition Turnings	16.75 to 17.25
Lead, Heavy	5.75
Tin Lead	5.50
Zinc Scrap	4.90

Iron and Industrial Stocks.

NEW YORK, November 28, 1906.

The most interesting event of the week was the upward movement in some of the minor iron and steel stocks. Virginia Iron, Coal & Coke stock jumped 10% on November 22, selling up to 78½, while Tennessee Coal again reached 160, Sloss-Sheffield common sold up to 77½ and Republic common touched 38¾. Suggestions were, of course, made that a consolidation of these interests was brewing, but nothing has appeared to warrant such a conclusion. The movement was possibly due to a better realization of existing trade conditions. Another interesting development was the manner in which Great Northern Ore certificates fluctuated on the "curb." These certificates declined in price until on Monday they sold down to 79½, being quite a drop from 92½, at which they had sold the previous week. On assurances by bankers that these certificates would not be discriminated against in making loans, they recovered on Tuesday to 84. The range of prices on the industrials usually active was as follows from Thursday to Tuesday: Car & Foundry common 43¾ to 45; Locomotive common 74½ to 76; Steel Foundries preferred 44½ to 47; Colorado Fuel 54 to 57¾; Pressed Steel common 53¾ to 54¾; Railway Spring common 52½ to 53; Republic common 37 to 38¾, preferred 99% to 101½; Sloss-Sheffield common 74 to 77½; Tennessee Coal 159 to 161½; Cast Iron Pipe common 46½ to 47%, preferred 88% to 89½; United States Steel common 47 to 48%, preferred 104% to 105%. Last transactions in active stocks up to 1.30 p.m. to-day are reported at the following prices: Car & Foundry common 44, preferred 101½; Locomotive common 75½, preferred 112; Steel Foundries common 10%, preferred 46; Colorado Fuel 54%; Pressed Steel common 54½, preferred 100; Railway Spring common 53; Republic common 38¾, preferred 101½; Sloss-Sheffield common 78; Tennessee Coal 161; United States Cast Iron Pipe common 47%; United States Steel common 47½, preferred 104%; Can common 6, preferred 55¾.

Stockholders in the Tennessee Coal, Iron & Railroad Company were officially advised November 22 by the directors of that corporation upon what terms they would be entitled to a portion of the new \$20,000,000 of common stock authorized at the stockholders' meeting on October 16. The announcement states that each shareholder of record on November 30 will have the privilege of subscribing for the new issue to the extent of 15 per cent. of his holdings of the outstanding stock by paying par, \$100 a share, in four equal instalments. The subscription privilege expires December 10, and 25 per cent. is to be paid at the time of subscription, 25 per cent. March 11, 1907, 25 per cent. June 10, 1907, and 25 per cent. December 10, 1907.

The \$6,145,800 stock of the Chicago Pneumatic Tool Com-

pany has been listed on the Pittsburgh Stock Exchange. According to the statement submitted, the authorized issue is \$7,500,000. In addition the company has a bond issue of \$2,500,000, of which \$200,000 is in the treasury. The stock now pays 1 per cent. quarterly, but paid 8 per cent. in 1902, 6 per cent. in 1903, nothing in 1904 and 4 per cent. in 1905. Net profits for the six months ending June 30 were \$386,741 after allowing for \$70,742 in depreciation. The balance, after paying \$112,175 in dividends, was \$182,065, making a total surplus of \$693,357.

Dividends.—The Republic Iron & Steel Company has declared the regular quarterly dividend of 1½ per cent. on the preferred stock and a dividend of 2 per cent. on account of the accumulated dividends on this issue, leaving 4 per cent. still unpaid. Both dividends are payable January 2.

The Railway Steel Spring Company has declared the quarterly dividend of 1½ per cent. on the preferred stock, payable December 20.

The National Enameling & Stamping Company has declared a quarterly dividend of 1½ per cent. on the preferred stock, payable January 1.

The Toledo Shipbuilding Company has declared an annual dividend of 7 per cent. on its capital stock.

The Niles-Bement-Pond Company has declared a dividend of 40 per cent. on the common stock, to be paid out of the accumulations of the past few years. The dividend is payable January 2 to holders of record November 30.

Customs Administrative Changes.

WASHINGTON, D. C., November 27, 1906.—Important changes in the plans of the Senate leaders with regard to the bill for the amendment of the customs administrative laws passed by the House last winter will result from the appointment of the North Customs Commission, which sailed for Germany on the 6th instant to receive the representations of the German Government concerning desired changes in our laws and regulations. The consideration of these measures, which was to have been taken up by the Senate Finance Committee before the meeting of Congress, will be deferred, and final action will be postponed until after the return of the commissioners, who are expected to reach Washington early in January.

The Pending Bill.

The measure now before the Finance Committee has received the indorsement of the Treasury Department, the Board of General Appraisers and the principal commercial bodies in New York City and elsewhere, which have advocated changes in the customs administrative laws. The only important feature of the amendments desired by the German Government incorporated in this bill is the change provided in Section 7 of the customs administrative act of 1890, which concedes a margin for nonpenalized undervaluations. The other features, while of great importance from an administrative standpoint, are not of special interest to German producers and exporters.

The suggestion has been made that in view of these facts the subject be taken up by the Ways and Means Committee *de novo*, and a new bill drafted embodying such changes as the Administration may decide to recommend, after receiving the report of the North Commission. There are important reasons, however, why the State and Treasury departments do not favor this plan, and it is not likely that it will be adopted. The coming session will consist of barely 60 legislative days, and it is of the utmost importance that every effort should be made to expedite the consideration of this matter. It is therefore regarded as advisable to present the project of the North Commission to the Senate Finance Committee in the shape of a series of amendments to the pending bill. This plan will obviate the necessity for the detailed consideration of a new bill by the Ways and Means Committee and its passage by the House. Of course it will be understood that any amendments adopted by the Senate must be concurred in by the House, but very little time would be necessary to secure concurrence, as the Administration programme would be unofficially before the Ways and Means Committee during its formal consideration by the Finance Committee.

Prompt Action Necessary.

Inasmuch, therefore, as the pending bill will probably not be taken up until some time in January, and must be

finally disposed of before adjournment on March 4, it is obvious that importers who are interested in any of the features of the measure or who may desire to urge the project to be recommended by the North Commission or any other changes in the customs administrative laws, must be prepared to take the matter up with the Finance Committee promptly and energetically when the bill is brought forward.

Much pressure has already been brought to bear upon the Senate Committee to accept the House provision, designed to take the Board of General Appraisers entirely out of politics. When the act of 1890 was passed it was thought this had been accomplished, but the courts have since held in the Shurtleff case that the President of the United States has the power to remove a member of the board without even giving a reason. The House bill provides that members of the board "shall not be engaged in any other business, avocation or employment, and may be removed from office at any time by the President only for inefficiency, mental or physical incapacity, neglect of duty, or malfeasance in office." This provision will limit the power of the President, and will also make it necessary in case of removal to assign one or more of the causes enumerated in the proposed statute.

There is also a strong sentiment in favor of the provision of the House bill under which appeals from the Board of General Appraisers would lie to the United States Circuit Court of Appeals instead of to the Circuit Court. Customs litigation would be greatly expedited by such change and the overcrowded dockets of the Circuit Court would be relieved. This feature of the House bill is amply safeguarded by a provision that re-hearings may be granted by the Board when the ends of justice may require it.

The Treasury Department is especially desirous that Congress shall increase the forfeiture limit of undervaluations from 50 to 100 per cent., as is provided by the House bill. Under the present law undervaluations of 50 per cent. or over are presumptively fraudulent and the collector is required to institute forfeiture proceedings. It is often impossible to prove fraud in such cases and the Government is put to much useless expense which it cannot hope to recover. By increasing the limit to 100 per cent. the collector would be enabled to take additional duties up to that amount instead of forfeiting the goods. There can be no doubt that the change would result in a very important increase in revenues and would have a salutary effect upon unscrupulous importers.

W. L. C.

Permits for Additional Niagara Power.

A Washington dispatch says that Secretary Taft will not decide until the close of the year on the applications of Canadian power companies to import into the United States electricity generated on the Canadian side of Niagara Falls. Negotiations have been begun between this country and the British Government looking toward a treaty to limit the diversion of water from Niagara River and the preservation of the scenic beauty of the falls, and Secretary Taft does not intend to take any action which will in any way interfere with the State Department in arranging the treaty. It is probable, however, that he will issue permits for the importation of 157,500 hp., which is the recommendation of Captain Kutz, of the engineer corps, and which he believes will not impair the beauty of the falls. The question how this power shall be apportioned among the three Canadian companies—the Canadian Niagara Power Company, the Ontario Power Company and the Electrical Development Company of Toronto—was argued this week before the Secretary of War.

The report that the Morgan Spring Company, Youngstown, Ohio, will build a large open-hearth steel plant, is authoritatively denied.

The Carnegie Trust Company will begin business in New York in December, with a capital of \$1,500,000. Charles M. Schwab is a director.

The Machinery Trade.

NEW YORK, November 28, 1906.

The heavy demand for machine tools continues, the inquiries received the past week being very numerous. Many of these covered tools aggregating \$25,000 in value. Orders came in in good volume and were it not for the distant deliveries a much greater business would be transacted. Most of those who have sent out inquiries desire the machines at an early date, and consequently will visit many of the dealers and manufacturers in an endeavor to pick up a machine here and there. Much favorable comment was heard concerning the plan to centralize the trade in this city.

A movement has been started by some of the prominent machinery men in this city looking toward the concentration of trade in one center. The matter has been taken in hand by F. H. Stillman, president of the Watson-Stillman Company, 26 Cortland street, New York, who has sent out a circular letter to the trade asking representatives of the machinery houses to be present at a meeting to be held December 6 at 3 o'clock in the afternoon in the board room of the New York Board of Trade and Transportation, 203 Broadway. The scheme, as outlined, is to bring the representatives of the various lines together in the large terminal buildings now in course of construction by the Hudson Companies on the blocks extending from Fulton to Cortland streets and from Church street to the North River. The machinery trade in this city has always been scattered to a great extent, and within the past year or two the destruction of buildings in what is known as the machinery section of the city has compelled many companies to either move farther uptown or to take inadequate quarters in the district in which most of the machinery people are located. Many in the trade seem to be favorably impressed with the idea of bringing a number of the machinery people under one roof, and it is thought that this move is in the right direction. Most classes of business concentrate in one section of a city, and much business is often derived from their location. In the machinery trade there are many advantages in the representatives of different lines being located together. The representatives of many companies under one roof would afford great convenience to a buyer coming to town, in that he could probably supply all his wants in the least possible time. It would also afford opportunity to inspect the samples of various manufacturers and would practically be a machinery exhibition. While the scheme is only in embryo as yet, enough interest seems to have been taken by the houses to assure its success, provided the rents are not too high. That seems to be the only objection to the scheme suggested by the dealers. Mr. Stillman has taken the matter up with the Hudson Companies and has arranged to have its representative appear before the meeting.

Efforts are being made to have a good attendance at the joint convention of the National Supply and Machinery Dealers' Association, the Southern Supply and Machinery Dealers' Association and the American Supply and Machinery Manufacturers' Association, to be held in Cincinnati, Ohio, early in May, 1907. The members of the American Supply and Machinery Manufacturers' Association received notices this week from F. D. Mitchell, secretary of that organization, reminding them that its officers are pledged to secure the largest possible attendance at the meeting by manufacturers in person, and it is urged that in addition to having traveling representatives at the session to meet the members of the two dealers' associations that each firm have a member or officer of the company attend the meeting. It is pointed out that the occasion will bring together for the first time heads and buyers of all organized dealers in machinery and supplies located in the United States, and on that account the meeting will have particular significance. This joint convention was in a measure arranged for at a meeting of the National Supply and Machinery Dealers' Association held in Detroit, September 26, and was confirmed at a later meeting of the manufacturers' association. There were some members of all the organizations involved, however, who had an idea that the plans for the joint session might miscarry, and it was not until recently that all concerned were assured that the present officers of the three organizations are enthusiastic for the meeting.

Machinery men will be interested in the report in another column of the annual session of the Leather Belting Association, held on Wednesday, November 21, in the Fifth Avenue Hotel, New York. The association, in addition to passing resolutions, including all the American and British American possessions in its jurisdiction, decided to raise the price of leather belting 12½ per cent., which in addition to raises made last year makes leather belting now 25 per cent. higher than it was two years ago.

Roteng Engineering Corporation's Machinery Requirements.

A good sized lot of machine tool equipment is to be purchased by the Roteng Engineering Corporation, 200 Broad-

way, New York, for increasing its capacity, which is not equal to cope with the large demand for its engines, compressors and pumps. This company, which was organized about a year ago and which maintains a factory at 235 Water street, Bridgeport, Conn., has leased a floor in the new Bush Terminal Building, No. 2, in South Brooklyn, which will very largely increase its floor space. In addition to the machinery which it already has in its plant and which will be installed in the new quarters, machinery consisting principally of lathes, turret lathes, milling machines, chucking machines, grinders, &c., aggregating in value from \$20,000 to \$25,000, will be purchased. For some time the company has been looking around for larger quarters than it has and selected the floor in the Bush Terminal on account of the many advantages in receiving and distributing its products and because of the large supply of labor in this section. The arrangements at the Bush Terminal are such as to obviate all work in connection with the receipt and shipment of goods, the Terminal Company taking care of that for its tenants. It is expected that the company will move to the new quarters the first part of the year. The purchase of machinery is in the hands of the superintendent, who is located at the factory in Bridgeport.

Quotations on a nice list of machine tools are desired by the Alton Mfg. Company, 11 East Twenty-second street, New York, which is doubling the capacity of its plant for the manufacture of inverted gas lamps, incandescent gas burners, inverted arc lamps and general lighting devices. The company is in the market for universal milling machines, universal grinders, screw cutting bench lathes, engine lathes, bench power presses, double seamers, thread rolling machines, automatic screw machines and power presses in sizes equal to 21 and 22 Biss. The company would be pleased to receive catalogues describing these tools and also catalogues of small tools.

Henry Pels & Co., 68 Broad street, New York, manufacturers of patent punching and shearing machines, are enlarging their plant at Hoboken, N. J., and are in the market for considerable machine tool equipment, including a planer, milling machine, grinding tools and gas engine.

Pipe machines to cut from $\frac{1}{8}$ to 2 in. pipe and from $2\frac{1}{2}$ to 12 in. pipe, the large machine to be equipped so that it can be used for pulling up flanges on pipe, and a 36-in. x 30-ft. lathe with taper attachment, are required by the Young & Vann Supply Company, Birmingham, Ala., which was recently incorporated to deal in steam fittings, valves, pipe, mill and mining supplies. The company will not manufacture a line of goods, but will install machines so that it can furnish pipe lines. I. F. Young is president and J. A. Vanu vice-president.

The Nashville, Chattanooga & St. Louis Railroad is preparing to rebuild its shops at Atlanta, Ga., which were recently destroyed by fire, but has not as yet completed plans for the buildings.

The Grand Trunk Railroad will soon remove its Toronto repair shops from the Esplanade to New Toronto, where large buildings will be erected and where, in addition to the regular repair work, the company will manufacture all the steel switches, frogs and crossings required for its entire system.

The Intercolonial Railroad is asking bids until December 10 for locomotive shops to be erected in its yards at Moncton, N. B., where it has in course of construction a large group of buildings. It is the intention of the company to construct a large number of shops at that point, some of them to be of considerable size, the main building being 176 x 408 ft. The foundations for three of the shops have virtually been completed, and some of the buildings are well under way, but on account of the winter weather it is thought that building operations will not be resumed on an extensive scale until spring.

Rhodes, Curry & Co., Amherst, N. S., are building large additions to their car shops, greatly increasing the capacity. The company has lately installed \$5000 worth of woodworking machinery and \$10,000 worth of machinery in its machine and forge shops. A rolling mill to contain 9-in. and 16-in. mills is being constructed, which will be ready for operation in January. The machinery for this plant is being constructed to a large extent by the Mesta Machine Company, Pittsburgh, Pa. The company has in contemplation additional improvements to its plant, including the doubling of the capacity of its axle shop.

The Buffalo & Susquehanna Iron Company, Buffalo, N. Y., has purchased the Hiawatha iron mine and adjoining properties near Norway, Mich., and is preparing to open up the property. While it is too early to give details concerning the erection of the new buildings and the installation of new machinery, it is the intention to equip the property in a first-class manner commensurate with the needs of the amount of ore which it is expected will be produced.

The New York office of the Mesta Machine Company reports among recent sales the following: The Worth Company, one 14 x 30 in. Corliss engine; the Orford Copper Company, four 16 and 32 x 30 in. horizontal cross compound Corliss engines and one 20 and 40 and 44 and 44 x 42 in. horizontal cross compound blowing engine; the Delaware,

Lackawanna & Western Railroad, three 12 and 22 x 36 in. tandem compound Corliss engines; Alsens American Portland Cement Works, one 27 and 54 x 48 in. horizontal cross compound Corliss engine.

It is understood that specifications are ready for the construction of an additional 50 miles of subway in New York, which it is estimated will cost about \$125,000,000. The Rapid Transit Commission is not as yet ready to give out the forms for proposals and the estimates for the work, but it is understood that before two months the bids will be advertised. The successful contractor will require considerable machinery for carrying on the work, in addition to a large amount of steel.

F. G. Tenbroeck, engineer, 309 Broadway, New York, is getting machinery for a large plant to be erected by the West Virginia Pulp & Paper Company. Mr. Tenbroeck now has inquiries out for power apparatus, and is asking for bids on one 2000-kw. generator and steam turbine to correspond.

The H. F. Taintor Mfg. Company, 200 Water street, New York, is making inquiries for equipment for a new plant the company has in course of construction at Bayonne, N. J. The plant will consist of a building 127 x 356 ft. one and two stories in height. The company is getting, in addition to other equipment, one 200-hp. Corliss engine to operate a rope drive and one 75-hp. high speed engine. It is understood that the buying will be done from the company's main office.

The Ridgway Machine Tool Works.

The announcement that the Niles-Bement-Pond Company has arranged to purchase the plant of the Ridgway Machine Tool Company has caused considerable comment in the trade, although it was known in some quarters that such negotiations were pending. From all accounts the Ridgway people have been doing a good business and had good prospects, but it is understood that the interests controlling the company wished to devote their entire attention to the Ridgway Dynamo & Engine Company, which is also located in Ridgway. The Ridgway Machine Tool Company was incorporated in 1903, with H. R. Hyde as president; P. R. Smith, vice-president; R. J. Powell, secretary, and E. C. Powell, treasurer. Lewis H. Morgan was manager and superintendent of the company's plant and he had charge of the equipment of the machine tool building establishment, which was one of the most up to date of its kind in the country, it having unusual facilities for the construction of heavy machine tools, including a most elaborate crane service. The main building of the plant, used as a machine shop, is 187 x 255 ft.; foundry, 112 x 150 ft.; forge shop, 75 x 150 ft.; and the pattern storage building and pattern shop the same size. The plant is admirably located on the Philadelphia & Erie Railroad, and taken altogether the Niles-Bement-Pond Company is acquiring an especially valuable piece of property. Under present trade conditions it would have been a difficult matter for the purchasing company to set up such an establishment within a reasonable period to expect of its being of much assistance in filling present orders, but now the company can get out a great deal of work in a shorter space of time than it could have hoped for without acquiring the Ridgway property.



Philadelphia Machinery Market.

PHILADELPHIA, PA., November 27, 1906.

Sales of machinery and tools have been rather light the past week and the trade expects a further falling off in business the coming month. This would not be anything out of the ordinary, as it is frequently the case that there is a cessation of buying in the closing month of the year, which is often not resumed in any quantity until about February 1. As a rule, would-be purchasers of machinery are preparing for the annual closing of the year's business and buying is often deferred on that account, except in cases where equipment is desired for emergency cases.

There is, of course, a certain amount of buying from day to day, and sales of tools to small buyers are still numerous. Purchases recently have been largely along the line of the smaller tools, and the bulk of the sales made have been for single tools. There is practically no demand for any extensive equipment at present, although it is rumored that several good lots will be before the trade early next year.

Inquiries, while not as numerous as some weeks ago, keep up fairly well, but they do not develop into orders quickly. In many instances they are believed to be prompted by the desire to know when deliveries could be made, but when the would-be purchaser finds that on some tools the delivery dates extend from four to ten months, the tendency to place orders weakens. In the case of some of the smaller

consumers, the purchase of tools so far ahead is not considered by them to be the best policy, as they are unable to see so far ahead in their particular line of business. With the larger buyer, this condition does not as a rule exist, and orders are placed more freely.

The volume of business in manufacturers' hands continues to increase. Day to day orders have been sufficient to keep their books filled, and there has been little chance to gain any on delayed deliveries. The prospect, therefore, for catching up in the near future does not appear very bright. Should business let up in December and January there would be some chance for improvement in future deliveries, but the tendency toward heavy production in that season is not very great, so but little can be expected under those circumstances. The inability to get materials, both raw and semifinished, promptly, is increasing, and in many instances shipments for early delivery can be had only by paying premiums, but as buyers are also willing to pay premiums for early deliveries of tools this should not be a very great hardship on tool builders. Normal deliveries of supplies, however, are in very unsatisfactory shape, and this together with the inability to get sufficient good mechanics makes it almost impossible to produce tools for delivery at specified times.

There is some little inquiry for tools for export in both the general and special lines, but the demand on the whole is not very active. Some few orders for special tools have been booked, but no business of any moment has been done in what might be termed the regular lines of machine tools. Some fair sales for specialties in power transmission equipment have been made, and such concerns as have a more or less regular trade abroad report conditions consistent with the season of the year.

Second-hand machine tools and equipment are in excellent demand, particularly for such as are in comparatively good condition. Dealers have no difficulty in disposing of such tools, the only difficulty experienced being that of keeping a sufficient number in stock to meet the demand.

The foundry situation is particularly good. Business continues to be offered in large quantities, and foundrymen are enabled in most cases to meet the demands of the trade. Contracts for delivery of castings the coming year have been closed in a number of instances, and from the volume of business offered there seems to be little chance for any improvement in deliveries, particularly in steel and the better grades of gray iron castings.

The Quaker City Rubber Works will erect two two-story buildings, 33 x 88 and 57 x 68 ft., at its plant at Comley street and Delaware avenue. These will be used to extend the manufacture of rubber goods, and considerable machinery adapted for that purpose will be required in their equipment.

The Department of Public Works, city of Philadelphia, is asking for bids under contract No. 83 for furnishing mechanics, tools, machinery, &c., for general repairs to boilers, engines, buildings and reservoirs, in cases of emergency; for the removal and setting up of a pumping engine from the Spring Garden Pumping Station to the Roxborough Station under contract No. 84; for plungers, pump chambers and valve seats and air chambers for the Queen Lane Pumping Station under contract No. 88, and for chamber castings and valve seats for the Roxborough Station under contract No. 87. Bids for all of these will be received by John R. Hathaway, director, until December 12.

The co-partnership of Pedrick & Smith, builders of machinery specialties, Germantown, Philadelphia, has recently been dissolved by mutual consent. Howard A. Pedrick retires from the firm and will act as superintendent of the shops of H. B. Underwood & Co., of this city. Charles A. Smith will continue the business of the old firm at the same location.

Barwood & Snider, machinery merchants, on the Bourse Machinery Floor, have recently obtained the agency in this territory for a drill changing chuck manufactured by the G. M. Yost Company, Waynesboro, Pa. They will also represent the Graham Mfg. Company, Providence, R. I., for the sale of that company's drill speeding device in the Philadelphia territory. These parties make the sale of such specialties an important feature of their business, and report a very active demand for these lines as well as for general machine tools.

The Energy Elevator Company reports a heavy demand for elevators of all classes. Several electric freight elevators have been ordered by local concerns, while orders for three hand power passenger elevators, one to be installed in a hospital at Oneida, N. Y., have been booked. Carriage elevators and hand freight elevators have also been in good demand, more particularly from out of the city parties. Shipments of elevators of all kinds have been heavy recently and, in addition to local deliveries, include shipments to Southern and Western States.

H. B. Underwood & Co. are busy in every department. There has been a large demand for their line of portable shop repair tools, and a good volume of business has been placed on the books the past month, including an order for a 10 in. by 27 ft. boring bar, with special fixtures, for the Wm. Cramp & Sons Ship & Engine Building Company of this city. They also received the order under contract No. 90 from the Bureau of Filtration, city of Philadelphia, for extensive repairs to pumps at the Lardner's Point pumping station, detailed mention of which has been already made in these columns. Shipments recently by Underwood & Co. have been extensive and include a number of heavy portable tools for various classes of work in both railroad shops and industrial plants in various parts of the country.

The Standard Pressed Steel Company notes an increased demand both from foreign and domestic sources for its American Pioneer steel shaft hanger. Orders from all sections of the United States have been good, and those received recently from abroad include orders from Switzerland, Vienna, Amsterdam and Honolulu, Hawaiian Islands. Every department of this company's plant is extremely busy, and shipments in quantity are being made for export to France, Austria and Australia. One domestic shipment for 200 2 7-16 x 16 in. hangers for one concern was recently made.

Chicago Machinery Market.

CHICAGO, ILL., November 27, 1906.

Machine tool manufacturers are now placing contracts for their 1907 casting requirements and the increased pig iron cost, which is on the average of \$6 a ton higher than when existing contracts were made a year ago, has resulted in advances on machine parts ranging from 40 to 50 per cent. One large boring mill maker places this added cost at 5 per cent. of the gross cost of his line of tools and has already made a like advance in selling prices. That other builders will take similar action is a certainty, as not only the gray iron founders but also steel casting producers must secure higher prices than are now prevailing to realize profits in view of present raw material costs. Industrial concerns continue to buy freely for extensions, and a number of lists are being prepared and will be submitted to the machine tool dealers and manufacturers in the near future.

Greenlee Bros. & Co., Rockford, Ill., manufacturers of woodworking machinery, are asking bids on approximately \$20,000 worth of tools for installation in their machine shop extensions now under way. The list is made up as follows: One 22 x 22 in. or 24 in. by 6 ft. iron planer, one 36 in. by 10 ft. iron planer, one 60 x 42 in. by 8 ft. iron planer, one full automatic spur gear cutter, largest gears to be cut 18 in. in diameter and with a heaviest diametral pitch of four; one automatic rack cutter, to handle racks up to 36 in. long and with a diametral pitch of three; one vertical milling machine, with table 12 to 15 in. wide and 4 ft. long; one hand milling machine, with cutter spindle to feed by hand lever instead of table; one heavy plain spindle grinding machine, to grind spindles up to 4 ft. 6 in. long and 2 1/2 in. in diameter; one standard knife grinder, with 19-in. wheel and plain table about 6 1/2 ft. long, but without automatic feed to table; one friction back geared turret lathe, to take about 2 1/2-in. belt, with 1 1/2 in. on larger hole in spindle, with turret about 8 in. in diameter and fitted with 1 1/2-in. holes, no cut-off slide, no automatic feed nor clutch; one cold saw, to cut up to 4-in. round bars; one 6-ft. radial drill and one 300-lb. upright helve hammer.

The Danville Car Company, Danville, Ill., has been organized, with a capital of \$250,000, and will erect a large plant for the manufacture of electric cars and coaches and the repair of freight cars. Quite a large tract has been acquired on the outskirts of Danville, which already has direct connections with the Illinois traction system, and the Big Four and Wabash railroads are now arranging to lay side tracks. Contracts for the erection of the buildings have been awarded to H. F. Vogel & Co., 420 Rialto Building, St. Louis, Mo., and include the following: Erecting shop for electric cars and coaches, 240 x 320 ft., with a 100-ft. transfer table at one end; woodworking shop, 60 x 180 ft.; cabinet shop, 60 x 180 ft.; varnish room, 60 x 120 ft.; engine room, 60 x 120 ft.; blacksmith shop, 60 x 120 ft.; truck shop, 60 x 120 ft., and a machine shop, 60 x 120 ft. A large freight repair shop will also be built, and track space will be provided for a large number of freight cars. All of the equipment will be electrically operated. Railroad specialties are also to be manufactured, and the company expects to be in a position to repair cars early in February.

The Waterman Marine Motor Company, Detroit, Mich., recently organized, will engage in the manufacture of a gasoline motor, commonly known as a detachable outboard motor, which can be suspended at the rear of any ordinary row boat and can be operated on a sail boat as an auxiliary power. Geo. W. Graves, architect, prepared plans

for the company's factory building, which will be 75 x 200 ft. and one story high, and will contain the testing room, machine shop, electric power plant and executive offices. Ample space has been provided for closets, washrooms and lockers for the workmen. None of the machinery has yet been purchased, but specifications are now being prepared and all inquiries regarding the same should be addressed to George W. Graves, Cleland Building, Detroit. The officers are Cameron B. Waterman, president, and Frank R. Thrall, secretary.

The Gould Balance Valve Company, Kellogg, Iowa, manufacturer of balance valves for locomotives, traction, portable and stationary engines, has increased its capital from \$45,000 to \$300,000, to provide for extensions made necessary by the recent growth of the company's business. An addition to the machine shop, 24 x 100 ft., will be built immediately and the purchase of 13 machine tools, including lathes, planers and shapers, will be negotiated in the near future. This will enable the company to triple its present output.

The Detroit Insulated Wire Company, Detroit, Mich., which recently completed a factory for the manufacture of insulated wire for telephone, telegraph and electric purposes, has plans prepared for the extension of its three-story building, which is 40 x 150 ft., to 40 x 340 ft., and it is the intention to erect four more buildings of the same size later, connected at the ends in gridiron shape. The officers of the company are E. E. Keller, president, and Arthur Hartwell, secretary and treasurer.

William M. Kenyon, architect, Guaranty Loan Building, Minneapolis, Minn., has prepared plans for the erection of the Soo Line boiler shop at that place, the main building of the plant having dimensions 119 x 202 ft. The cost of the structure is placed at \$67,000.

The Standard Pulley Company, Cincinnati, Ohio, has increased its capital from \$10,000 to \$25,000, and will increase its capacity by the erection of an addition to its foundry 30 x 100 ft. A machine shop will also be built, 40 x 238 ft., plans for which are now under way. The company will be in the market for the equipment of these extensions very shortly. *

The Locomotive Finished Material Company, Atchison, Kan., has been organized for the manufacture of gray iron castings for locomotive parts. The company will buy its castings sections from the John Seaton Foundry & Mfg. Company. Considerable machine shop equipment is being purchased, including a 50 hp. gas engine. The officers of the company are John Seaton, president; Clyde Hastings, vice-president, and H. E. Muchnie, secretary and general manager.

The Anderson Foundry & Machine Company is being organized at Battle Creek, Mich., and has already been incorporated with a capital of \$100,000, of which \$68,000 has been subscribed and paid. It is the intention of the company's officials to manufacture mill supplies and engines, and as soon as the organization is completed steps will be taken looking toward the erection of a manufacturing plant.

The Mills Novelty Company, Chicago, manufacturer of automatic amusement, musical and vending machines, has leased for 20 years an eight-story and basement building at the northeast corner of Jackson boulevard and Green street, having dimensions 166 x 198 ft. The company will move into its new quarters about the first of the year, and practically all of the present equipment will be taken to the new plant. A large amount of machinery is to be purchased, however, but nothing definite will be decided upon until after the company's removal.

"Machinery Row," Chicago, has again been visited by a disastrous fire, the building at 14-16 North Canal street, in which were located a number of supply and equipment manufacturers as well as the salesrooms of several companies in kindred lines, having been completely destroyed last week, entailing a loss of nearly \$100,000. The first floor was occupied by the American Steam Gage & Valve Company and the Adkins, Young & Allen Company, dealers in pumps and engine supplies. Others in the building included the Star Plating Works, E. P. Read, manufacturer of stop screws and washers, and the John Booth Architectural Iron & Wire Works.

The Commissioner of Public Works, Chicago, will receive proposals until December 5 for furnishing one duplex steam compound air compressor, one engine lathe and one feeder voltage regulator.

The Crandall Packing Company, Chicago, Ill., manufacturer of patent packings, has moved its Cleveland office from 9 Water street to the Wade Building, 805 Superior street, Northwest, where it carries an enlarged stock to enable it to take care of its stationary and marine business, which is handled from the Cleveland office.

The Calumet & Hecla Mining Company announces that an advance of 10 per cent. in wages will be made to employees, beginning January 1. There are 5000 men on the payroll.

New England Machinery Market.

WORCESTER, MASS., November 27, 1906.

It is in the air that another general advance in machine tool prices will soon go into effect. Serious consideration is being given the question by a number of the large machine tool manufacturers and probably there are few who have not had the matter up for discussion. This is in spite of the fact that an advance recently went into effect, including practically everything that is classed as a machine tool, together with many other accessories of the machine shop. If there is to be another increase in prices in the near future it will be by no concerted action, though, as conditions affecting the various branches of the industry are closely identical, it is probable that action will be, generally speaking, simultaneous. It was very much like this when the last increase in prices went into effect, manufacturers following one another in quick succession, until the entire trade had marked prices up from 5 to 10 per cent. Since then there have been scattering announcements of new lists containing still other advances. The planer builders are probably the first seriously to contemplate another advance, for the same reason that applies to all heavy tools, the higher price of castings. Lathe builders also feel that the market, combined with increased costs, warrants yet another raise. Other standard lines are similarly affected. The new list of one of the builders of large grinding machines shows an increase in the prices of several machines, but it is explained that this is the nature of a readjustment, to put these few machines on the same basis of profit as the rest of the line.

The machine tool builders feel that in advancing prices they are doing so for the future and not at all for the present. Recent advances have not gone into effect yet, as far as they affect the receipts of the manufacturers, nor will they for some months to come in most cases. Many tools are being shipped to customers which were ordered at prices that prevailed last April. The machine tool builder must meet the increased cost of material and labor long before he gets a corresponding benefit from the higher prices that he gets from his own customers. The condition of deliveries hits the machine tool trade for these reasons. A further advance at this time would be preparing not for the immediate future, but for the later part of 1907, and frequently for 1908. It is confidently expected by every one, so far as can be learned, that business conditions will not change for the worse next year, and machine tool builders taking orders for delivery many months ahead must prepare their prices with due regard to what they may expect to meet in the cost of their material and labor. It is significant in connection with the talk of higher prices that the machine tool builders do not offer the objections that they raised when other changes to higher prices were discussed.

The New England foundries, as generally as when the recent advance was made, have begun to announce an advance of $\frac{1}{4}$ cent per pound for iron castings, and other classes of castings are going up in the ratio as the materials which enter into their composition.

Many more works are successfully operating with night shifts, because they have succeeded in getting together and training enough men to make it possible. The effect of specialized training, resulting from working under forced conditions, is bearing rich fruit; otherwise night gangs would be impossible under economical conditions.

The experience of the Niles-Bentley-Pond Company in the purchase of 24 second-hand engine lathes of the Vermont Farm Machinery Company, Bellows Falls, Vt., is an indication of the machine tool market. The purchasers notified a few customers that these tools were in the market, and their sale was immediately assured at the shops at Bellows Falls. The Vermont Farm Machinery Company had replaced this machinery with a number of automatic and semi-automatic tools, which had been ordered some 16 months ago. There was sharp bidding among the dealers who were asked to submit figures for the lathes, some of which were practically new.

The Saco & Pettee Machine Shops, Newton Upper Falls, Mass., are buying a considerable amount of machine tools, in equipping new works now under construction.

The United Shoe Machinery Company, Beverly, Mass., learned a lesson from previous experience and placed orders for the equipment of new extensions of the works well in advance of their completion.

The Bassett Machine Works, Norfolk Downs, Quincy, Mass., is to erect a new machine shop building, 48 x 100 ft., one story.

Harvey Hubbell, Incorporated, Bridgeport, Conn., manufacturer of machinery, tools, electrical specialties and machine screws, is to erect a large addition, which will greatly increase the capacity of the works. The new building will probably be 50 x 100 ft., four stories and basement. It will

be built of reinforced concrete throughout and will be in every respect a modern fireproof building. The company, which is a Connecticut corporation, has filed a certificate announcing an increase in capital stock from \$100,000 to \$150,000.

Morton E. Converse & Son, Winchendon, Mass., toy manufacturers, are contemplating certain improvements to their works which will require the purchase of machinery. A large building about to be erected is for painting and finishing, and the other improvements will follow after. The company manufactures toys of both wood and metal.

The Miller Bros. Cutlery Company, Meriden, Conn., manufacturer of pocket cutlery, &c., is to build an addition to its factory, either two or three stories and 32 x 60 ft. The question of power has not been determined, the company not having decided whether to install a gas engine and producer or a motor drive.

The Union Metallic Cartridge Company, Bridgeport, Conn., is erecting four new buildings, each 40 x 122 ft., two stories, and covered with corrugated iron. A one-story frame building connects them. They will be devoted to the manufacture of metallic ammunition. The company states that no new machinery is required.

The new building of the Fellows Gear Shaper Company, Springfield, Vt., referred to in *The Iron Age* last week, will be 35 x 185 ft.

The Perkins Machine Company, Warren, Mass., manufacturer of presses, has completed an addition to its foundry.

The Atlantic Insulated Wire & Cable Company, Stamford, Conn., whose plant was destroyed by fire recently, will immediately build a new plant on its own property and expects to have it in operation in 60 days, every effort being concentrated to that end. The plant will be 150 x 300 ft., two stories and of reinforced concrete. The company's loss in the fire was total, aggregating \$225,000.

It is announced that the Hoag Rapid Press Company, San Francisco, has acquired a tract of land at Hartford, Conn., 300 x 600 ft., and proposes to erect a large works on the premises for the manufacture of an automatic printing press.

The acquisitions of New England street railroad properties by the New York, New Haven & Hartford Railroad, in building up its great system now covering most of Connecticut, Rhode Island and southern and central Massachusetts, is watched with much interest by all those houses which manufacture or deal in street railroad supplies. An important announcement has just been made that the Consolidated Railway Company, which operates the New York, New Haven & Hartford street railroads, has acquired the street railroads known as the Ray system, centering in Woonsocket, R. I., and reaching out in several directions, including lines connecting the consolidating line from Worcester, thus establishing a complete line from Worcester to Providence. Negotiations are pending for the property of the Rhode Island Company, which covers the city of Providence and much suburban district. The Ray system has 72 miles of railroad, and the Rhode Island Company controls much more than that. The New Haven people already own the Worcester and Springfield systems and the lines between those centers, as well as practically all the Connecticut lines. The new car barn to be built by the company at Meriden, Conn., will have a repair shop 40 x 80 ft.

The American & British Mfg. Company is contemplating material additions to its Bridgeport works, to enlarge its automobile department. The company has been manufacturing frames for motor cars for some time and it is now proposed to enter the automobile field on a large scale, though the company does not plan to put a car of its own on the market. All work will be for outside parties, under contract.

Cincinnati Machinery Market.

CINCINNATI, OHIO, November 27, 1906.

The week's business compares very favorably with its predecessor, and all the shops are crowded with work. Foreign demand appears to have been fairly equally distributed throughout the months of the year, and continues strong. Dealers in new and second-hand machinery are well supplied with orders, and find ready shipment for all tools that come into their stores.

Ground has been broken at Oakley for the Colony Buildings by the Cincinnati Milling Machine Company, where a foundry building will be erected as soon as possible. This building, which will also contain office quarters, will be 350 x 450 ft. In addition to this there will be a pattern building, 50 x 160 ft., also a power plant, 75 x 100 ft. It is understood that the company will continue to operate its present plant on Spring Grove avenue until such time as circumstances demand a complete consolidation of the two plants.

The Licking Coal & Iron Company has been incorporated under the laws of Kentucky, and will take over the Licking

Rolling Mill Company, the J. Droege Sons Foundry Company, the J. Droege Sons Coal Company and the William Clark Furnace Company. John C. Droege is president; F. W. Droege, vice-president, and Frank Macke, secretary and treasurer.

The R. K. LeBlond Machine Tool Company has been making some extensive additions to its plant the past two or three months. These improvements consist of an extension 40 x 80 ft., three stories, together with a balcony 20 x 100 ft., erected in the shipping department. This addition is on the south side and adjoining the present building. A new line of cutter grinders is to be brought out, and the balcony and second floor of this building will be utilized for this purpose. The third floor will be used for building milling machines, in addition to the present shop. The first floor will be used for erecting the Quick Change boxes for engine lathes. It appears that the demand for these Quick Change lathes has increased to such an extent that a special department is necessary in which to handle them. On the north of the present building a section 30 x 60 ft., three stories, has been added, and also one section 60 x 60 ft., one story. The three-story section is separate and distinct from the present building and has fire walls from top to bottom. Here on the third floor will be located the drawing room, on the second floor the main office and on the first floor a stockroom for finished material. The floors in both drawing room and office are 4 in. thick, the top being of quarter sawed oak. The building is of the latest mill construction, the first floor being of concrete. This makes the building virtually fireproof, as all the windows overlooking the shop are fitted with fire shutters and wired screen glass. The saw tooth roof section immediately behind this office building, which is the new 60 x 60 ft. section, is made with concrete floor and is divided into three parts, each being driven by independent motors. This will be used exclusively as a lathe and milling machine department. Immediately north of this improvement is being erected a two-story building, 40 x 170 ft. This building is of brick and cement construction, and will be used for casting storage purposes and for cleaning and painting castings. The first story of this building will be 21 ft. high, which will permit the installation of an electric crane for traversing all casting bins. This building will be fitted with the Hunt industrial railroad, with the tracks running from the casting storage building to the main machine shop, supplying the chucking department, planer department and the erecting rooms. The second floor will be used for cabinet work purposes. The floor space incorporated in these improvements will be 32,000 sq. ft., making the total floor space of the entire plant when completed 97,000 sq. ft. In addition to this all the buildings will be served with electric hoists and cranes, and all of the machine and vise hands will have compressed air for cleaning and assembling the work. Among the additional equipment to be installed will be a large Ingersoll-Rand air compressor, Niles three-motor crane, several Pratt & Whitney special tools, several Cleveland automatic machines, several Niles-Bement-Pond planers, Brown & Sharpe gear cutters and grinders, and a number of the company's own lathes and milling machines. The entire plant will also be equipped with the Manufacturers' automatic sprinkler system, in connection with which a 30,000-gal. tank and a 100,000-gal. cistern are being installed. In this connection President LeBlond states that business has now reached a condition where it is simply a question of output.

The Scott Roofing & Mfg. Company, Cincinnati, has been incorporated with a capital of \$50,000 by Edwin D. Bevitt, John G. O'Connell, E. G. Ruder, B. R. Milikan and H. L. Olden.

The Millcreek Valley Starch Company will take over a large concrete building at Winton Place, and equip it with from \$12,000 to \$15,000 worth of new machinery.

Government Purchases.

WASHINGTON, D. C., November 27, 1906.

Proposals will be received until December 26 by the Superintendent of the United States Capitol Buildings, Washington, D. C., for the equipment for a heating, lighting and power plant, including boilers, engines, generators, pumps, condensers and other apparatus.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until December 26 for the following machine tools for the Mare Island Navy Yard and San Francisco Naval Training Station: Schedule 271, water tube boilers, arbor press, metal saw; schedule 272, lathes, pipe bender, milling machines.

The Bureau of Yards and Docks, Navy Department, Washington, will receive bids until December 22 for four electric traveling cranes for the Portsmouth Navy Yard.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until December 11 for motor, pneumatic hammers and drills, arbor presses, pipe benders,

lathes, vacuum and feed pumps for the Eastern navy yards.

The following awards have been made for machinery for the Isthmian Canal Commission, bids for which were opened October 23, Circular No. 334:

The C. T. Patterson Company, New Orleans, La., class 11, two back geared pillar crank shapers, \$1137.40.

Manning, Maxwell & Moore, New York, class 12, one set horizontal bending rolls, \$1257.15.

Fox Bros. & Co., New York, class 14, one combination band, rip and resaw machine, \$772.95.

Under bids opened November 13 for machinery for the navy yards the Niles-Bement-Pond Company, New York, has been awarded class 1, three electric traveling cranes, \$17,970.

The following awards have been made for supplies for the navy yards, under opening of October 9:

The Chicago Pneumatic Tool Company, New York, class 90, two Little Giant drills, \$147.

The Prentiss Tool & Supply Company, New York, class 100, one combined folder and brake, \$158.

The following awards have been made for supplies for the navy yards, bids for which were opened October 30:

The Niles-Bement-Pond Company, New York, class 23, one full universal radial drill, \$13,060; class 24, one slotting machine, \$925; class 44, two engine lathes, \$3824.

The Pratt & Whitney Company, Hartford, Conn., class 41, two gibbed carriage engine lathes, \$1740.

Manning, Maxwell & Moore, New York, class 21, one pattern makers' lathe, \$487; class 22, one pattern makers' lathe, \$590.

The Fox Machine Company, Grand Rapids, Mich., class 31, one band saw machine, \$163.80.

The Fairbanks Company, New York, class 47, one swing patent head screw cutting engine lathe, \$1480.

The Oliver Machinery Company, Grand Rapids, Mich., class 55, one double disk sand papering machine, \$575.

The Lincoln Electric Mfg. Company, Cleveland, Ohio, class 184, two variable speed motors, \$548.

The Westinghouse Electric & Mfg. Company, Pittsburgh, Pa., class 222, one 15-hp. motor, \$320.

The Chicago Pneumatic Tool Company, New York, class 224, a number of portable electric grinders and drills, \$1232.

The Independent Pneumatic Drill Company, Chicago, Ill., class 225, a quantity of pneumatic drills and hammers, \$2355.

Labor Notes.

E. H. Gary, chairman of the Board of Directors of the United States Steel Corporation, announces that the wages of common labor in the plants of the subsidiary companies of the corporation will be increased. The official notification reads as follows: "Common labor at the manufacturing plants of the subsidiary companies of the United States Steel Corporation will be increased 10 cents per day, commencing January 1, 1907, and day and turn labor will be adjusted accordingly. Notices to this effect will be posted by the respective companies about December 1, 1906." An advance had been expected for some time.

The Warren Foundry & Machine Company, Phillipsburg, N. J., voluntarily increased the wages of its employees 10 per cent, beginning November 15.

The Fall River textile manufacturers have granted the demands of the men for a 10 per cent. advance, a previous offer of 5 per cent. having been rejected.

Among the Central Pennsylvania puddle mills which have started up this month by effecting settlements with their workmen are the Chesapeake at Harrisburg, Penn at Lancaster, Reading at Danville and Scranton Bolt & Nut at Scranton.

Labor in New England machine shops is said to be eminently well satisfied with conditions. Wages have been advanced quite materially and the ratio of increase is probably larger in the machine shops than in any other line of manufacturing in New England, and this is in the face of general advances in a number of important lines of business.

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The National Steel & Wire Company's Reorganization.

The National Steel & Wire Company, 114 Liberty street, New York, has issued a circular letter to its stockholders stating that the great increase in business of the controlled companies has made it evident that some financial plan larger in scope than that under which the parent company was organized must be put in operation, in order that sufficient working capital may be available for the economical handling of the increased business and the establishment of the finances of the company on a thoroughly stable basis. The plan adopted, which provides not only for increased working capital, but also for the acquisition of such additional plants and properties as may be desirable from time to time, is as follows:

The National Consolidated Wire & Cable Company has been incorporated under the laws of the State of Maine, with an authorized capital as follows: \$8,000,000 first lien 50-year 5 per cent. bonds, \$8,000,000 5 per cent. cumulative preferred stock, \$8,000,000 common stock. Of these securities there will be issued at the present time \$4,000,000 of the bonds and such stock as may be necessary to take up the outstanding securities of the National Steel & Wire Company or its controlled companies and \$1,000,000 of the bonds to provide additional working capital. The remaining \$3,000,000 of bonds will be reserved for future needs. The basis of exchange for present holdings is as follows: \$1000 preferred stock or voting trust certificates covering preferred stock of the National Steel & Wire Company for \$1000 bonds and \$400 preferred stock of the new company; \$1000 common stock of the National Steel & Wire Company for \$100 preferred stock and \$1000 common stock of the new company; \$1000 bonds of the Safety Insulated Wire & Cable Company, or the National Wire Corporation, for \$1000 bonds and \$400 preferred stock of the new company; \$1000 of the stock of the Safety Insulated Wire & Cable Company, the National Wire Corporation, or the National Steel Foundry Company, for \$100 preferred stock and \$1000 common stock of the new company. The holdings are to be deposited with the Knickerbocker Trust Company, 66 Broadway, New York.

In addition to this basis of exchange the present stockholders of the National Steel & Wire Company are offered the opportunity of subscribing for the \$1,000,000 of additional bonds for working capital to the extent of 50 per cent. of their present holdings of preferred stock of the National Steel & Wire Company at 95, the subscriptions to carry a bonus of 20 per cent. of common stock of the National Consolidated Wire & Cable Company. Deposits of stock for exchange and subscriptions for bonds must be made on or before January 1, 1907. President Le Roy Clark states that all the company's plants are now completed, orders are booked at very profitable figures for the entire output for some months to come, and with the financial support of the stockholders the coming year should be a notable one in the history of the company.

The North American Cement Company has been incorporated under the laws of New Jersey, with offices at 15 Exchange place, Jersey City, and a capital stock of \$10,000,000. The incorporators are J. Rogers Maxwell of Brooklyn, Henry Graves of Irvington-on-the-Hudson, Alphonse de Navarro, New York; Harry C. Trexler and Edward M. Young, Allentown, Pa.; Arnold F. Gerstell, Easton, Pa.; John B. Wright, Montclair, N. J.; Robert W. Lesley, Haverford, Pa.; J. B. Lober, Bryn Mawr, Pa., and Ernest R. Ackerman, Plainfield, N. J. This company will, it is understood, take up the interests of the following cement companies: Atlas Portland Cement Company, Alpha Portland Cement Company, Lehigh Portland Cement Company, Vulcanite Cement Company and the Lawrence Cement Company. The company, it is said, will spend \$5,000,000 of the capitalization in extending its works. As yet, however, no announcement has been made as to the plans for the proposed additions.

The production of nickel in Canada for the year 1905 showed a marked increase, having been nearly 19,000,000 lb., as compared with 10,500,000 lb. in the previous year.

HARDWARE

MANUFACTURERS who desire to improve their methods of cost finding and of general factory accounting without attempting as complete a change in methods as would result from calling in an expert would naturally look to the superintendent or person in charge, explaining to him what they desire to accomplish and endeavoring to secure his active and hearty co-operation. It is entirely within his province in harmony with the management to introduce such changes gradually or at once as will bring the cost system and the general factory accounting up to the desired standard. Sometimes, however, the man who is responsible for the existing system is hard to move in the direction under consideration, and instead of being a help in the installment of a better one is an actual hindrance. In such case it is necessary to overlook or supersede him, looking to another source for the initiation of up to date methods. In such a juncture there are usually two courses open to them. They may select from their clerical force a man whom they consider best fitted to undertake making the necessary changes, or they may engage a new man for this purpose. Each plan has its advantages.

A man selected from the employees has a knowledge of the routine of the business, which it requires a long time for a new man to acquire. He is acquainted with the personnel of office and factory and with the idiosyncrasies of the people with whom he has to deal. On account of his service with the company he has the confidence of its officers from the beginning. These advantages cannot be overlooked.

On the other hand, a new man coming in from outside usually has the advantage of a broader experience; he is untrammeled by the familiarity that at times embarrasses an old employee; he has no friends to lose and all to make. He feels strongly the necessity of making progress, for much will be expected of him. He must either "make good" or make room for some one else. As a stranger he is an unknown quantity to the employees, and changes as a rule are accepted with better grace because respect for a new man is usually greater than for the old.

In any event, whichever plan is followed it is necessary that sufficient authority be given the man of whom such work is required. He must have the full support of his employers if he is to make progress. A man should not be selected because he has proved a good clerk, for many times these men, on account of their training, are not adapted to progressive work. Good reasoning powers are an absolutely essential qualification, for the man equipped with what is termed "common sense" will not be apt to make changes before carefully weighing the advantages which will accrue from such changes. In order to handle the foremen and men who will more or less be affected by the changes to be made another necessary qualification is tact. Of course those qualifications to succeed in almost any line are also requisite. Among these may be mentioned thoroughness, straightforwardness, energy, ambition, loyalty to the employer and a sincere and intelligent desire to advance the welfare of the establishment.

Condition of Trade.

While the Hardware market feels the influence of the near approach of the holidays and the end of the year, evidences are lacking of anything that might be termed a reaction, as regards either volume of business or in the strength of prices. There is a sustained activity in staples and specialty lines, as orders are placed to fill up depleted stocks and sometimes in anticipation of the advances, which are of daily occurrence in various quarters of the market. There is, however, but little speculative purchasing. Wire Cloth and Poultry Netting are commanding special attention, as the market on these goods opened later than usual and presented new features requiring some study on the part of the jobbing trade. These lines, however, are indicative of the well defined trade tendency to concentrate most of the year's business into a short period of time, and the two weeks since the market opened have been strenuous ones for the manufacturers. Jobbers in all sections of the country report a large volume of business in spite of the fact that retailers' requirements on some lines are below the normal, on account of the open winter experienced last year. Nearly all classes of goods continue scarce, and manufacturers as a rule are making little progress in catching up with their accumulated orders. The resulting delays and disappointments are perhaps the greatest disturbing factor in the trade to-day, adding to the care and detail of doing business, increasing correspondence between manufacturer and merchants, wholesale and retail, and causing much inconvenience to consumers. In the prevalence of such conditions manufacturers are fully occupied with the business which comes to them through regular sources and show little or no disposition to solicit orders. Similarly the natural competition among jobbers is somewhat slackened, and the common tendency to shade established prices or undersell the manufacturers on an advancing market is less apparent than usual. Collections are fair, but some complaint is heard.

Chicago.

As compared with last November the volume of business transacted by several of the leading jobbers in the West this month shows a comfortable gain and the decline in the total from October's phenomenal record was not as great as generally anticipated. The mild weather which has prevailed throughout this section has militated against the movement of winter goods from retailers' stocks, but there has been a proportionate increase in the consumption of commodities used in building operations, the requirements in these lines being the heaviest in the history of the Hardware trade at this season of the year. The shortage of Field Fencing reflects the activities in the rural districts and the strength of the Nail market coupled with low stocks is indicative of the tremendous building operations that are being prosecuted without interruption. Manufacturers of Wire products report that the new tonnage booked this month is almost on a par with that taken on in the same period in October, the late advance having had little apparent effect on the buying movement. Makers of Wire Cloth are now canvassing the trade for orders for shipment during the coming season and considerable business is being placed. Quotations announced two weeks ago are subject to withdrawal at any time and on shipments to points beyond the Mississippi River the freight is added from the river to the place of delivery, while on Poultry Netting the freight is added beyond the Missouri River. Refriger-

ator manufacturers are preparing for a record trade during the coming season, and several that sell the jobbing trade exclusively declare that they are falling behind in production, not only on account of the large orders that have been placed, but because of the difficulties that are being met with in securing raw material, notably Sheets and Trimmings. In the Stove trade filling in orders have not been as heavy as anticipated as a result of the heavy early movement, and the indications are that the late fall trade will be below expectations.

NOTES ON PRICES.

Wire Nails.—The open weather throughout the country has permitted the continuance of building operations to an unusual degree, with a consequent large demand both in the way of specifications on contract orders and new business. Mills are still somewhat behind in orders though an improvement in deliveries is apparent, but mills are not accumulating stocks. Quotations are being fairly well maintained. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers	\$1.90
Carload lots, to retail merchants.....	1.95

New York.—Demand keeps up in good volume for the season, but not quite as active as earlier in the month. The new prices adopted by the jobbers last week are being fairly well maintained, and will probably be more closely adhered to as stocks purchased at lower prices become exhausted. New York quotations are on the following basis: To retailers, carloads on dock, \$2.09; less than carloads, on dock, \$2.23; small lots at store, \$2.20 per keg.

Chicago.—Despite increased mill shipments, the shortage of popular sizes grows more pronounced daily, consumption being maintained at a record rate as a result of the open weather, which permits building operations to be carried on without interruption. New tonnage placed with the leading interest this month is almost on a par with October's total and the independent makers likewise report heavy buying, the recent advance notwithstanding. None of the mills have been able to accumulate stocks, and the indications are that December will find them with barren floors, an unusual condition in the trade this late in the season. Quotations are firmly maintained, as follows: \$2.05 in car lots to jobbers and \$2.10 in car lots to retailers, with an advance of 5 cents for less than car lots from mills.

Pittsburgh.—New demand for Wire Nails continues quite heavy, in spite of the fact that the large jobbing trade pretty well covered its requirements for some time ahead prior to the recent advance in prices. Specifications on contracts are being received by the mills in good volume, and shipments are heavy. While there is still a shortage in cars and in supply of Steel slightly better deliveries are being made, but the mills are still considerably behind in orders. The favorable weather contributes to a heavy consumption of Nails, there being as yet no restriction in outside building operations. The market continues strong and we are advised that official prices are being firmly held. We quote Wire Nails at \$1.90 in carloads to the large jobbing trade, and \$1.95 in carloads to retail merchants, f.o.b. Pittsburgh, plus actual freight to point of delivery, terms 60 days, less 2 per cent. off for cash in 10 days.

Cut Nails.—Manufacturers do not seem able to supply the requirements of the trade, especially in certain sizes. Some contract orders placed before the recent advances have not yet been filled, while new business is reasonably heavy. Mills outside of the association are reported as asking about 10 cents per keg premium over official quotations, for anything like prompt shipments. Quotations are as follows, f.o.b. Pittsburgh: Carload lots, to jobbers, \$1.95; less than carloads, to jobbers, \$2; less than carloads, to retailers, \$2.10. Iron Cut Nails at points west of Buffalo and Pittsburgh are held at 10 cents advance on Steel Cut Nails.

New York—The lack of well assorted stock in job-

bers' hands and the inability of manufacturers to fill orders somewhat magnifies the demand from consumers. At the present moment 8-penny flooring Nails are particularly scarce in this market. New York quotations for small lots at store are on the basis of \$2.20 per keg.

Chicago.—Effective Thursday, November 22, Steel and Iron Cut Nails were advanced 5 cents a keg. Still higher prices are expected by the trade, owing to the shortage and high cost of raw materials, and on many sizes mill shipments are deferred 30 days. Quotations are revised as follows: Steel Cut Nails, in car lots, \$2.10 to \$2.15; less than car lots, \$2.20; Iron Cut Nails, \$2.20 to \$2.25, in car lots; less than car lots, \$2.30.

Pittsburgh.—We note a considerable shortage in supply of certain sizes of Cut Nails, and the large jobbing trade is having some trouble in filling specifications of customers promptly. The new demand is fairly heavy and stocks, both at the mills and in jobbers' hands, are badly broken. Mills outside the association continue to quote somewhat higher than the official prices, asking premiums of about 10 cents per keg over these prices for reasonably prompt shipment. Official prices, on which premiums of about 10 cents per keg are being paid to mills outside the association, are as follows, f.o.b. Pittsburgh: Carload lots, to jobbers, \$1.95; less than carloads, to jobbers, \$2; less than carloads, to dealers, \$2.10. Iron Cut Nails at points west of Buffalo and Pittsburgh are held at 5 and 10 cents advance on Steel Cut Nails.

Barb Wire.—Jobbers are having a good demand, owing to favorable weather for out of door operations and stocks in their hands are sufficient for requirements. The mills are not expecting a revival of business until after the turn of the year. Official prices are referred to as being maintained. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots.....	\$2.05	\$2.35
Retailers, carload lots.....	2.10	2.40
Retailers, less than carload lots.....	2.20	2.50

Chicago.—The consumption of Wire in the rural districts is heavy as the weather conditions are favorable for outside work, and retailers report a fair movement. Jobbers' stocks, however, are sufficient to meet these requirements, and no revival in activity from the makers' standpoint is anticipated before the first of the year. We quote: To jobbers, Chicago, car lots, Painted, \$2.20; Galvanized, \$2.50; to retailers, car lots, Painted, \$2.25; Galvanized, \$2.55; retailers, less than car lots, Painted, \$2.35; Galvanized, \$2.65; Staples, bright, in car lots, \$2.15; Galvanized, \$2.45; car lots to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

Pittsburgh.—The amount of new tonnage being placed is relatively small, but owing to the favorable weather is somewhat larger than usual at this late season of the year. No increase in demand is expected until the new year, when the trade will commence to place orders for the spring delivery. The market is firm and our advices are that official prices are being maintained. These prices are as follows: Painted Barb Wire, \$2.05, and Galvanized, \$2.35, in carload lots to the large jobbing trade, with the usual advance of \$1 a ton to retailers in carload lots, f.o.b. Pittsburgh, 60 days, or 2 per cent. off for cash in 10 days.

Smooth Fence Wire.—Demands upon the mills continue larger than they can fill promptly, especially from Wire Fence manufacturers. Specifications are received in large volume, so that requirements are greater than the capacity of the mills, and shipments are consequently delayed. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads	\$1.75
Retailers, carloads	1.80

The foregoing prices are for base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

	6 to 9	10	11	12 & 12½	13	14	15	16
Annealed.....	Base.	\$0.05	.10	.15	.25	.35	.45	.55
Galvanized.....	\$0.30	.35	.40	.45	.55	.65	1.05	1.15

Chicago.—Specifications that are coming to the mills

are greatly in excess of capacity and shipments are being still further deferred. The requirements of Field Fence manufacturers are almost insatiate, while on many grades used for general manufacturing purposes deliveries are delayed from one to two months. Quotations are unchanged as follows: Jobbers, \$1.90, f.o.b. Chicago, in car lots; retailers, \$1.95.

Pittsburgh.—Demand from the manufacturing trade continues unusually heavy for this season of the year, while specifications on contracts are being received by the mills in large volume and deliveries are still more or less restricted by shortage in cars and supply of Steel. Official prices are being firmly held, and the general tone of the market is strong. These prices are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days.

Jobbers, carloads \$1.75
Retailers, carloads 1.80

The above prices are for base numbers, 6 to 9.

Sap Spouts.—Charles Millar & Son Company, Utica, N. Y., quotes the following prices on its Sap Spouts in quantities of less than 1000:

Ideal Sap Spout, Open Pattern, per 100.....\$1.50
Ideal Sap Spout, Closed Pattern, per 100..... 1.70

When ordered in quantities of 1000 or more a discount of 10 per cent. is given from the above prices.

Jute Leads and Ties.—The scarcity of Jute and the high price at which it is now selling are reflected in an advance of about 10 per cent. in Jute Halter Leads and Horse and Cattle Ties.

Chisels.—Prominent manufacturers of Chisels have made a concerted advance in their prices, amounting to 10 per cent. or thereabouts. The movement may be characterized as a sympathetic one, influenced by increased productive cost as well as by the recent upward trend of allied lines of tools. Seventy-five per cent. discount may now be quoted as a fair price to retail merchants on Socket Firmer Chisels and 40 per cent. on Tanged Firmer Chisels and Gouges.

Hammer Handles, &c.—A strengthening tendency is noted in the market for Hammer Handles, &c., although it does not appear that quotable advances have generally been made as yet. Manufacturers refer, however, to an increasing scarcity of wood suitable to their requirements.

Rivets.—At a meeting of leading manufacturers of Rivets, held last week, a moderate advance in prices was agreed upon. In accordance with the new schedule the published discount on all except Metallic Tinned Rivets is 70 and 10 per cent., and on Metallic Tinned Rivets, 70 per cent.

Porcelain Knobs.—Prices on Porcelain Head Picture Nails and Picture, Drawer and Shutter Knobs have this week been advanced about 10 per cent. by representative manufacturers.

Fruit Cans.—The American Can Company has withdrawn the quotations on Fruit Cans, recently announced to the trade and it is assumed that higher prices may be expected.

Bolts, Stove and Tire.—There are evidences of a better understanding among manufacturers of Stove and Tire Bolts than has existed for many months. Although the market for these goods has long been an open one, prices have recently shown a noticeable upward tendency, due to enormous demand, enforced delays in filling orders, and the higher cost of raw material. The most serious differences between manufacturers are now believed to have been adjusted, and more or less uniformity is shown by quotations, Stove Bolts being quoted at a discount of 85 and 10 and Tire Bolts at 80 per cent. discount, with the usual concessions to jobbers and other large buyers.

Cutlery.—The market for Table Cutlery is still characterized by the strengthening tone referred to in our last week's issue. One important manufacturer has made a distinct advance, and others are withdrawing outstanding quotations as if anticipating a similar change. It is generally believed that cheaper grades of goods cannot much longer remain on the low level

brought about by the sharp competition which has prevailed this year.

Leather Belting.—The list prices of Leather Belting and Cut Lacing were advanced by the Leather Belting Manufacturers' Association of the United States at a meeting held in New York on November 21, going into effect on that date. No change was made in prevailing discounts. Higher prices are considered advisable, owing to the continued advance in Hides and Leather. The revised lists are as follows:

<i>Leather Belting.</i>					
Width. Inches.	Price per foot.	Width. Inches.	Price per foot.	Width. Inches.	Price per foot.
1/8	.12	8	\$1.44	25	\$ 6.00
1/4	.15	6 1/2	1.56	26	6.24
3/8	.18	7	1.68	27	6.48
1/2	.21	8	1.92	28	6.72
1	.24	9	2.16	29	6.96
1 1/4	.30	10	2.40	30	7.20
1 1/2	.36	11	2.64	32	7.68
1 3/4	.42	12	2.88	34	8.16
2	.48	13	3.12	36	8.64
2 1/4	.54	14	3.36	38	9.12
2 1/2	.60	15	3.60	40	9.60
2 3/4	.66	16	3.84	42	10.08
3	.72	17	4.08	44	10.56
3 1/4	.78	18	4.32	46	11.04
3 1/2	.84	19	4.56	48	11.52
3 3/4	.90	20	4.80	50	12.00
4	.96	21	5.04	52	12.48
4 1/2	1.08	22	5.28	54	12.96
5	1.20	23	5.52	56	13.44
5 1/2	1.32	24	5.76	60	14.40

Double Belts twice the price of single.

Extra Heavy Belts, extra prices.

Cut Lacing.

Both Raw Hide and Tanned.					
Width. Inches.	Price per bundle.	Width. Inches.	Price per bundle.	Width. Inches.	Price per bundle.
1/4	\$1.25	1/8	\$2.00	3/4	\$8.75
1/2	1.50	3/8	2.25	5/8	4.50
3/4	1.75	5/8	3.00	1	5.00

Put up in 100-ft. bundles.

As representing current prices on the above, the following discounts may be named:

Extra Heavy, Short Lap.....	60 and 5%
Regular Short Lap.....	60 and 10 and 5%
Standard	70%
Light Standard.....	70 and 5%
Cut Leather Lacing.....	45%

Rope.—While demand is not quite as large as it was earlier in the month it keeps up in fairly good volume. The strong position of Hemp has a steady effect upon the Rope market, so that prices are fairly firm. New York quotations are as follows: Pure Manila, 12 1/2 to 13 cents; B quality, 11 1/2 to 12 cents; Pure Sisal, 9 1/4 cents; No. 2 quality, 8 cents; No. 1 Jute, 1/4 in. and up, 8 1/2 cents; No. 2 Jute, 7 1/2 to 8 cents per pound.

Shotguns.—Leading makers of Firearms have made an advance of about 10 per cent. in the price of single barrel Shotguns. This of course applies to the competitive Gun of the cheapest grade made by nearly all manufacturers on practically the same lines. The level on which these goods have been selling is declared to have been very low, due to the sharpness of competition and even after the present change is effective retail merchants can doubtless purchase Guns of this grade at \$3.25 to \$3.50, especially as jobbers may have stocks purchased at the former level.

Sash Cord.—Manufacturers of Cotton Sash Cord have generally advanced their quotations 1 cent per pound. This brings the base price for braided white Cotton Cord up to 25 cents per pound, on which a concession of 3 per cent. is offered by the manufacturers in purchases in 100 dozen lots. It is stated that the additional premium formerly allowed on 500 dozen lots has been withdrawn.

Pumps.—Firmness in prices on Pumps, referred to recently in these columns, continues to be the characteristic feature of the market. A number of manufacturers have withdrawn their quotations and are issuing new discount sheets representing advances of 10 per cent. and even more. It is doubtful if the discount to the retail trade on Pitcher Spout Pumps is better on the average than 75 and 10 per cent. to-day. Leading pro-

ducers of Pumps state that higher prices are necessitated by present conditions, and refer to recent advances of two points in the base discount on Pipe, 2 cents per pound on seamless Brass Tubing and other items in proportion. Some also infer that further advances in their lines may be expected before long.

Window Glass.—It is understood that the capacity of factories whose output is to be sold through the National Brokerage Company is 2156 pots. This does not include the product of the American Window Glass Company, who, it is reported, will continue to sell independently of the brokerage company. The price of the latter is 90 and 5 per cent. discount for single and 90 and 10 per cent. discount for double strength Glass. The prices of the American company are reported as 90 and 10 for single and 90 and 15 per cent. discount for double, 16 x 20 single excepted, on which the present price is 90 and 5 per cent. discount. A meeting of Eastern Jobbers is scheduled for this week, when the project of reviving the jobbers' association is to be considered. Jobbers quotations, from jobbers' list, October 1, 1903, are as follows: Greater New York, single, 90 and 10; double, 90 and 15 per cent. discount.

Linseed Oil.—The usual curtailment in buying toward the end of the month has resulted in less activity in the Oil market. Seed has shown slight advances for both November and December deliveries. The trend of the Seed market will be watched with interest for the next week or so, as the closing of navigation, which will take place in the early part of next month, is regarded as likely to act as a check to the buying of Seed by crushers. No change has taken place in Oil prices in this market. New York quotations are as follows, according to quantity: City Raw, 42 to 43 cents per gallon; out of town Raw, 41 to 42 cents per gallon. Boiled Oil is 1 cent per gallon over Raw.

Spirits Turpentine.—A holiday and the close of the month both coming in this week has resulted in a rather quiet local Turpentine market. A slight decline from last week's quotations is noted. New York quotations are as follows, according to quantity: Oil Barrels, 70 to 70½ cents; Machine Made Barrels, 70½ to 71 cents per gallon.

DISHONESTY AMONG BUYERS.

BY FRED. BRADFORD ELLSWORTH.

In the commercial world the Golden Rule is often lost sight of. Many buyers formulate a Golden Rule of their own—namely, if by trickery and misrepresentation they can take advantage of a salesman with whom they are dealing, it is shrewdness. If the same methods are pursued by the salesman, it is downright dishonesty. A fine example in this enlightened generation!

I WONDER if the old proverbial saying, "His word is as good as his bond," ever smites the conscience of many buyers? I wonder if the good old days they tell about, when honesty was a virtue above heroism, will return again? As history repeats itself, then just so surely will there be a repetition of the same. Already those days are returning, and the time is not far distant when a man who does not do as he agrees to will be ostracized from the better class that predominates in the business world.

There Are More Dishonest Buyers

than there are salesmen employed by really honest houses, for often their dealings with a salesman are unknown to the firm and not so easily found out. A dishonest salesman is generally reported at once, and if representing a reputable firm he is summarily dismissed. I say there are more dishonest buyers; there are, for their underhand, dishonest methods are often sanctioned, approved and encouraged by their employers. Yet they represent institutions whose integrity is seldom doubted and whose financial standing is A1.

About the Lowest Despicable Trick

a buyer can stoop to in his dishonest methods is making

a liar out of a salesman. This the buyer tries to accomplish by making deductions from bills, claiming that the salesman quoted the prices thus modified. Sometimes firms allow this, giving the buyer the benefit of the doubt rather than create any unpleasantness. But it does not take them long to find out that the buyer is crooked.

Many buyers of this class play a nearly corresponding trick that is likewise interesting knowledge. They deduct from bills and claim the privilege by saying that they had quotations or prices equalizing the credits. Such arguments are "vaporings of a buggy intellect." A man would be just as much privileged to negotiate a loan at a bank at, say, 6 per cent. interest, and offer to settle at 3 per cent. I wonder what the consequences would be? I think the bank officials would ring for the "wagon" and have him taken to the "wheel house," or send him where he could lead the "simple life" at the expense of the State. This breed of buyers missed their vocation in life.

The Buyer Was the Liar.

A salesman called on a buyer one day and quoted him a price on a car of goods to be specified for within 30 days and shipped in 60 days. The offer was accepted. The salesman dictated a contract and the buyer signed it. The buyer specified for the car on time, but made the order read to be shipped 15 days later than agreed upon. The firm wrote him calling attention to the contract time and the buyer acknowledged it. When the salesman visited the buyer again the buyer remonstrated with him for the goods being shipped sooner than he ordered. The salesman informed him the goods were shipped according to contract. The buyer in a domineering, bulldozing manner gave the salesman to understand he didn't know what he was talking about and that he never signed such a contract. The next time the salesman called he had the contract and correspondence and said to the buyer:

"The last time I was here you doubted my veracity and insulted me. I have the documents proving my assertions to be correct."

The buyer looked over them and blandly replied:

"Why, that's all right, old man; I never said anything different. You were excited that day and must have misunderstood me."

The salesman, utterly nonplussed and absolutely disgusted with the man's methods, at an opportune moment took his departure. The bill fell due and only through threats of a lawsuit was collected. Yet the firm has a good rating and is considered good pay. Their true rating, according to their treatment of people, in Bradstreet or Dun, should be "No Good."

Another Fitting Illustration

of assumed privileges occurred recently. A large jobbing horse agreed to take a car of goods providing the same could be shipped at a certain freight rate, which was questionable. In the meantime the buyer was to try and make up a car of other material at a different place and if the car could not be had at the doubtful rate they would have some of the goods go forward in the car of other material. The salesman agreed to this, conditional that the mixed car be shipped in a week.

When the salesman found it impossible to procure the freight desired he notified the buyer to that effect. He also informed the buyer that since prices had advanced it would be to the buyer's advantage to take the car at the regular freight rate. He also impressed upon him that the car must be shipped at once. The buyer paid no attention to the letter. The salesman's firm on receiving no reply also wrote the buyer, calling his attention to his negligence in not answering the letter and that if he desired the car it must be shipped at once. Later they withdrew prices, and about the same time received a letter from the buyer requesting more time to make up a car. When the buyer found prices had advanced very materially he ordered the full car shipped, claiming this, that and the other excuse for his negligence. What kind of a buyer would you call such a man? Is it not plain?

A Rupture After 10 Years.

An experience of my own is worth narrating. I had sold goods almost uninterruptedly for over 10 years to a

certain jobbing house. Our relations had always been of the most pleasant nature. In fact, I prided myself upon the conditions that existed, never for a moment fearing that they would be ruptured. I called on the buyer one day and quoted him prices on several cars of goods. I told him frankly that prices were advancing and that my prices were for immediate acceptance only. He declined to place an order, saying he could do better. After he had convinced himself that the conditions were as I had represented he attempted to place a very large order at the old price, and it was declined. Because of his own inability to load up at old prices at that time, and no doubt nettled because he failed to take advantage of an opportunity, he claimed he had not been taken care of, and when I met him he addressed me in language not found in books. Was anything ever more ludicrous?

Dishonest Buyer's Business Dear at Any Price.

I have come in contact with buyers for many years, have made a study of them as a child is taught its A, B, C's, and have still lots to learn. I have gained their confidence and respect and in many instances their friendship. Personally I have never had very much trouble with them, but when I find them "not on the square" I simply try and guard myself against any pitfalls. Experience, however, has taught me that a dishonest buyer's business is dear at any price. Eventually he will beat you in the end.

The Right Sort of Honesty.

In conclusion I wish to say for my part give me the buyer who does things honestly because he never knew of any other way. That's the fellow you can bank on. He doesn't manifest a conscience to go with his acts. He doesn't play with marked cards. He shuffles them above board. He doesn't give you the "glad hand," with icicles hanging to his finger tips. He is simply honest because he couldn't be otherwise if he tried. And you can't find a better honesty than that.

TRADE ITEMS.

THE CHICAGO RETAIL HARDWARE ASSOCIATION, Chicago, has been incorporated under the Illinois State laws for the protection of its members. The incorporators are George E. Englehardt, H. E. Gnadt and W. B. Costello.

FRANKLIN R. ALLEN, Greenfield, Mass., for many years head of the firm of S. Allen's Sons, Hardware merchants, died in that town November 20, aged 84 years. He was the oldest merchant in Greenfield. In his young manhood he intended to study for the ministry, but left college to enter the business establishment of his father upon the dissolution of the firm of Root & Allen. He was at one time president of the Greenfield Gas Company, and for years was the clerk of the Franklin Savings Institution. He was a member of the corporation of the Franklin County Public Hospital.

WOLFF, LANE & CO., one of the oldest hardware jobbing concerns in Pittsburgh, Pa., after having occupied the building at 304 Wood street, in that city, for nearly 40 years, has leased another building at 105-107 Wood street, to which it will remove on April 1, 1907. The new location will afford materially increased space which the company badly needs in view of its expanding business.

JOHN M. HART COMPANY, Chicago, has been appointed exclusive selling agent for the Hanover Wire Cloth Company, whose large mills for the manufacture of Wire Screen Cloth are located at Hanover, Pa. The entire product of the plant will be sold through this agency.

A CIRCULAR recently issued by the National Hardware Mutual Fire Insurance Company, Huntingdon, Pa., states that the company, which was organized three years ago, now has more than \$1,400,000 insurance in force. Policyholders receive rebates yearly amounting to 25 or 30 per cent. on their premium.

A HANDSOME easel sign advertising and illustrating the Universal Coffee Percolator is being sent to the Hardware and House Furnishing trade by Landers,

Frary & Clark, New Britain, Conn. The sign is 12 in. wide by 10 in. high and is made of white crystaloid, presenting a highly finished surface. The lettering is in red and blue and the Percolator is reproduced in the natural colors of the Empire pattern, which is made of aluminum with ebonized handle. It is an X-ray view, so-called, showing the entire interior of the pot when in operation and the appetizing brown of the brewing coffee.

E. C. ATKINS & CO., Indianapolis, Ind., will celebrate in 1907 the fiftieth anniversary of the establishment of their business. In connection with this event the company contemplates something in the way of a pleasant surprise for its friends, and it is already beginning to celebrate by the use on all its correspondence of a rich gold seal, appropriately significant of a golden anniversary.

THE next annual meeting of the Missouri Retail Hardware Association will be held at Kansas City, Mo., January 17 and 18. The Implement Dealers' Association will hold their convention at the same time, so that a very large representation of the Hardware and Implement trade of Missouri, Kansas and Indian and Oklahoma Territories is confidently expected.

PRICE-LISTS, CIRCULARS, &c.

CHALLENGE REFRIGERATOR COMPANY, Grand Haven, Mich.: Catalogues devoted respectively to Triumph White Enamel Lined, Challenge Iceberg, Grand Hardwood and Victor Refrigerators. The insulator used in the White Enamel Lined Refrigerators is made by quilting and sewing hair between two thicknesses of best insulating paper, the hair being the same as is used in hair felt.

BEALL BROS., Alton, Ill.: Catalogue of Miners' Tools and Miners' Supplies, including Picks, Pick Eyes, Wedges, Post Drills, Bars, Shovels, Hand Axes, Saws, Lamps, Car Movers, Rail Binders, &c.

FOSTER-RICHARDSON COMPANY, Westboro, Mass.: Catalogue illustrating the Red Diamond line of Metal Bedsteads.

BELLEFONTAINE HAME COMPANY, Bellefontaine, Ohio: Price-list No. 3 of Wood Hames, Hame Trimmings, &c.

MICHIGAN BARREL COMPANY, Grand Rapids, Mich.: Catalogue No. 10 illustrating lines of Yukon, Economic Chilkoot and Porcelain-Steel Refrigerators. The latter have provision chambers lined with porcelain on 18-gauge steel, giving a pure white lining.

CLEVELAND BLOCK COMPANY, Cleveland, Ohio: Catalogue devoted to Snatch Blocks, Blocks for Wrecking Work and for Wire Rope and Handy Blocks for farmers and others who now use Wooden Blocks for light work.

BOGERT & HOPPER, 162 William street, New York: Catalogue relating to Turned Wood Boxes, Handles, Dowels, Locked Corner Packing and Mailing Boxes, Cases for Tools and Heavy Hardware, Advertising Rules and Yardsticks, Package Handles, &c.

THE STANDARD STAMPING COMPANY, Marysville, Ohio: Circulars and folders relating to Spray Pumps, Carriage Heaters, Lawn Sprinklers and Bread Toasters.

STANDARD HORSE NAIL COMPANY, New Brighton, Pa.: Illustrated catalogue of New Standard Plate and Countersunk Horse Nails; also Brighton, Russell, Bright Shear Blue and Beaver brands.

COBB & DREW, Plymouth, Mass.: Price-lists devoted to Spring Cotters and Spring Keys; Staples, Double Pointed Tacks; Tacks, Nails, Brads, &c.

THE COMMERCIAL ACETYLENE COMPANY, 80 Broadway, New York: Catalogues describing the General Acetylene Generator for house lighting and the Safety Storage System for lighting railroads, yachts and craft of all descriptions, both power and sail, lighthouses, buoys, &c.

Barnes-Miller Hardware Company has succeeded Thomas, Barnes & Miller in the wholesale and retail Hardware business in Memphis, Tenn., W. G. Thomas retiring. The new company has a capital of \$175,000 and will carry Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements, Sporting and Athletic Goods.

Hints as to Show Window Display.

THREE is no doubt that Hardware merchants are giving increasing attention to the matter of window display. They are more and more appreciating the importance and value of arranging their windows in a manner that will command the notice and secure the approval of the public. Some merchants indeed regard the advertising resulting from carefully and tastefully arranged show windows fully as beneficial as that obtained by taking space in the newspapers, while its cost is not near so large. The windows of the store are coming to be recognized as a very potent means of catching the public eye and impressing people with the up to dateness, enterprise and energy with which the business reflected by them is conducted.

Many letters have come to us on this subject, extracts from some of which are given below. They emphasize what is said above in regard to the trade winning virtues of intelligent window displays, and also contain some pointers as to goods which may be used in this connection and the principles which should govern in making effective exhibits. Coming as they do from merchants of ability and experience who have met with substantial success, they are well worth perusal at the hands of those who are alive to the necessity of adopting twentieth century methods in going after business.

Subjects for Window Exhibition.

FROM AN INDIANA MERCHANT: The lines best fitted to the season yield best results of course. New goods always attract attention and are a good medium to call attention to common or old lines.

FROM AN ILLINOIS MERCHANT: We have had very satisfactory results with standard and staple lines and lines that one would not think would attract attention. Of course Sporting Goods, Cutlery, Silverware, Fancy China, Cut Glass, Nickel Plated Goods, Washboard &c., attract more attention, owing to their popularity, appearance, &c. We have filled a window full of Washboards, pricing each article, and accomplished very desirable results with this homely and useful article.

FROM A TENNESSEE HARDWAREMAN: Any line of Hardware, Stoves, Lamps, Holiday Goods, Seeds for the garden and, in fact, almost anything carried in a stock of Hardware can be displayed so as to catch the eye of the public.

FROM A MERCHANT IN IOWA: Nickel goods make a fine window display, whether shown as a line or as separate articles. Enamelled Ware, Plated Anything for the Kitchen. Tableware, Steel Knives and Forks, Cutlery, Shears and anything for the kitchen, properly displayed with attractive window cards will pay for the trouble.

FROM A MASSACHUSETTS MERCHANT: A household line, such as Scales, Meat Choppers, Knives and Forks, &c., yields as direct results as any line. Dull Months' Displays. Still, we show nearly all our lines in their season, and in the dull months of the year we show those goods that the people in general do not know we carry, as Pulley Blocks, Scale Beams, Brooms, Brushes, Paints, &c.

FROM A PENNSYLVANIA MERCHANT: We find an increased demand for Nickel Plated Copper Ware, Enamelled Ware and Tinware when properly shown in our show windows. Also for Carpenters' Tools and specialties in any kind of Shelf Hardware.

FROM A MERCHANT IN NORTH CAROLINA: All lines should have attention and display. We believe that for the best general results the lines Bright and Attractive. such as Brass Andirons, Fenders, Pocket Knives, Saws, Hammers, &c., which look bright and attractive, give the best results, both for sales of the articles themselves and for the impression of general attractiveness about the store.

FROM A PENNSYLVANIA MERCHANT: I have one window made up of Cutlery and Sporting Goods; the other window with House Furnishing Goods, Rough &c. I sometimes put rough goods into my Goods. windows, such as Rope, Twines, Garden Implements, Lawn Mowers, &c., thus making a very great change, which I notice attracts considerable attention.

FROM A MISSOURI HARDWAREMAN: I have two show windows. One I devote to displaying household goods and the other to Tools and Builders' Hardware. If I had but one window I would never crowd nor mix things in the window.

FROM A NORTH DAKOTA MERCHANT: Such goods should be used as will make an attractive appearance, and I prefer only one line for each window. Of course the value depends to a large extent on the size and style of the show windows. It goes without saying that the display should be seasonal and of a class of goods that will interest a large number of people. It may Novelty be a novelty or it may be a staple line. or Staple. If the latter, I like to make a display that will give the idea that I carry a large and a complete line of the goods shown. If it is a novelty, the value may consist partly in drawing customers into the store to inquire about it. This may give the competent clerk an excellent opportunity to show other goods.

FROM A MINNESOTA FIRM: The main thing is to get an attractive display which ought to yield results in a general way in all lines. Do not think that the object of a window display is ordinarily to sell goods exposed.

FROM A WISCONSIN MERCHANT: I believe one line of goods should be displayed at a time, because anybody looking at a window where a good many different lines are shown will become confused and the effect it should have produced is lost. This does not mean that you should confine yourself to one article. If you are displaying a Range, a few Pans and Cooking Utensils Auxiliary Goods. tastefully arranged will enhance the effect and produce a better result. But if you were showing some fine Tools it would not be very wise to have the background set off with a Washing Machine or Wash Wringers. I would add that a price attached to any article displayed will frequently sell it, with a little talk on the part of the salesman.

FROM A MICHIGAN HOUSE: Articles attractive in finish and which enter into daily use yield the best results, such as necessities in the house, Clothes Wringers, Tin, Nickel Plated and Enamelled Ware and many other useful household articles.

FROM AN INDIANA HOUSE: We have very large show windows, not boxed off from storeroom. Our storeroom is 2 feet above the sidewalk and we display goods inside each window on the store floor. Our manner of doing this is to arrange the goods in separate lines, one line to each window. For example: Corner window, plumbing goods. A bathroom fitted up with Porcelain Tub, Porcelain Wash Basin, Marble Lavatory, Siphon Jet Closet, complete, fitted up as for use. Window No. 2: Big Four. Display of Clothes Wringers, Washing Machines, Churns, Brooms and Mops. Window No. 3: Blacksmiths' Tools, Forges, Anvils, Blowers, Vises, &c. Window No. 4: Farming Implements and Tools. We change about every three weeks and can trace many sales to such displays.

FROM A HOUSE IN NEW ENGLAND: We notice that our displays of Tools and Sporting Goods attract the most attention, and that all of our displays result in making sales. As a rule we confine our displays to one line of goods, such as Carpenters' Tools, Builders' Hardware or Cordage, but sometimes depart widely from this and make a general display covering many lines. We are watching all the time for opportunities for special displays, and at this writing have one window devoted to samples of work done by a boys' club who are being

taught the "Sloyd" system of carpenter work and using Tools furnished by us.

Windows with a Reputation.

The bottoms of the windows are not over 15 in. above the sidewalk level and are beveled to take handsome brass signs, bearing our name both in front and on the sides. We have made our windows so attractive that there is a demand for them for displays, like the one mentioned above, which, while perhaps not drawing immediate customers, keeps our name before the public, which is the aim of all advertising.

FROM AN ALABAMA HOUSE: Last Christmas we had one window fitted up as a kitchen, in which we displayed a nice Range and all the Cooking Vessels, which was very unique, as we had "Old Dinah" in charge of the kitchen, and then in another large window

Holiday Displays. we fitted up a parlor in which we displayed Cabinet Mantels and suitable holiday novelties, such as Fire Sets, Coal Vases, Brass Fenders, &c. One window we devoted entirely to Sporting goods and the other to Cutlery and Tools.

FROM A NEW HAMPSHIRE HOUSE: Our method of window display is to show kindred goods at the same time.

dows, and we think we get better results than when we have many interested in the same work.

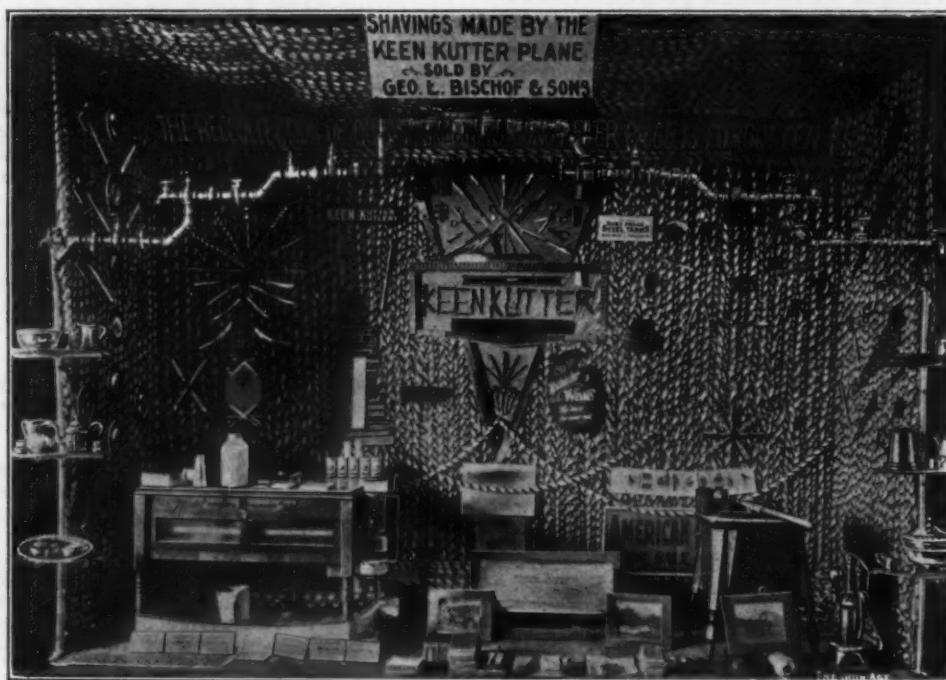
FROM A MERCHANT IN NORTH DAKOTA: One of my clerks is quite original and looks after my window displays. I never interfere with him.

FROM A MASSACHUSETTS HOUSE: The work of decorating our windows falls to the clerk whom we have found by experience to produce the best results.

FROM NORTH CAROLINA MERCHANTS: We have never undertaken to have a regularly employed window dresser, but we find it is decidedly best to have one man in charge of the window display, and then encourage the balance of the force to make suggestions to him. In this way the head of the house is relieved of the care of the matter, and simply suggests, just as the clerks do.

**COUNTY FAIR
HARDWARE EXHIBIT.**

SEVERAL months since we illustrated an effective window display made by an Arkansas firm in which shavings constituted the special feature of the exhibit.



County Fair Hardware Exhibit.

For example, Paints, Varnishes and Brushes at one time, Tools, Cutlery and House Furnishing Goods at another, except Sporting Goods, such as Bicycles

Price Ticket Every Time and Photographic Supplies. One of our windows is given up exclusively to latter goods, and they are on display all the time, the exhibit, of course, being changed frequently. The most important thing of all is to have a price ticket in plain figures on all articles.

Working the Newspaper and Window Together.

FROM A CANADIAN HARDWAREMAN: We try to make at least one of our windows correspond to the advertisement in the daily paper.

FROM A CONNECTICUT HOUSE: After having dressed a window we advertise, calling attention to the display in the north window, mentioning the line of goods offered. We make a similar reference to the south window. We find that advertising in connection with a display has proven in our case always satisfactory.

FROM AN ILLINOIS MERCHANT: We try to show such goods in the window as we have advertised that particular week, and generally change our windows once a week, in the main part. The windows which are trimmed with Tools, &c., are not changed as frequently.

Window Display Should Be in Charge of One Man.

FROM A CONNECTICUT MERCHANT: We take one clerk and make it a part of his business to look after the win-

Herewith we reproduce another exhibit in which the shavings idea has again been admirably applied. In this case the display was made at a county fair, and was in the interest of Geo. L. Bischof & Sons, Hardware merchants, Rock Port, Mo. The exhibit attracted much attention and the firm received many flattering compliments on it. It will be observed that Keen Kutter tools occupied a conspicuous place in the display. The space was 14 ft. wide, 10 ft. high, and 4 ft. deep. The background was of purple cloth, and over that were shavings of white pine and cypress, cut in lengths by a Keen Kutter Plane. E. C. Simmons' famous expression, "The Recollection of Quality Remains Long After the Price Is Forgotten," worked out from $\frac{1}{4}$ in. Sisal Rope, was given a prominent position at the very top of the background. Below this, in the center, was a device typifying the Keen Kutter trademark. The top was a 6-ft. Cross Cut Saw, beneath which were Pruning Saws, 15-in. Nickel Plated Paper Hangers' Shears, Chisels and Hand Saws. The block or square comprised two Squares, two Corn Knives, supporting a Level, forming the fourth side. The lower part of the wedge was made of Buck Saw Blades, with Silver Spoons and Drill Bits in the center. The words Keen Kutter were made out of Pocket Knives.

To the right of the trademark were Sad Iron Handles and Stove Lid Lifters, forming a half circle, with the lower part made of Steel Halter Chains. To the left were Auger Bits, from $\frac{1}{2}$ to 2 in., in a half circle, with

lower half made of Butcher Knives, a Shear sign appearing below. Between the trademark and the Butcher Knives was an assortment of Files, fastened together with Brass Wire—43 different kinds and no two Files alike—all taken from stock. On the left side, or end, were Hatchets, with Flue Stops. The right end showed Saws and Braces. The arch in front was constructed of Pipe Fittings taken from stock, a Plane having been suspended from the arch in center. The shelves in front on the sides were made from $\frac{3}{4}$ -in. Pipe, bronzed, and supported Rochester Nickel Plated Ware. To the right on the floor were a Pump and Washing Machine, and on the left was an Incubator in the act of hatching, with little chickens underneath.

DOING JOBBING WORK SATISFACTORILY.

WITH a good system and a little care jobbing work can be done with satisfaction, particularly to the merchant's customer. This is important, for the satisfied customer is the basis of a successful business. A job of repairing done by a good workman in a neat and substantial manner and finished at the time it is promised makes more lasting impression on the women folks of the household or the superintendent of a factory than would

for plumbing work. The customer's order explains that there is a leaky faucet in the kitchen on property owned by P. G. White, at 239 Main street, occupied by Mrs. Smith. The property being in charge of a real estate concern, who has ordered the work done, the charge on the book is made against the firm, and a space is provided to show who the order came from. This is necessary, as not infrequently people forget having given an order and unless there is some record there may be a disposition to refuse to pay for the work done.

A blank space is provided so that the workman can state the condition under which the work was done, give an account of the time spent and the materials used. Not infrequently these slips are signed by some one at the house to show that the work has been completed satisfactorily, which is also an important record in making collections. By having them in duplicate in the order book a record is made of the workman to whom the job order is given, who can be called to account if he does not return the slip given to him in a reasonable time to have the charges made. This should be done while the work is fresh in his mind, so that if any particulars may have been overlooked in making his record they can be brought to his mind and included, so that no item of expense shall be omitted to reduce the profit or possibly make a loss.

It is of great importance that jobbing orders receive careful attention during the rush season, otherwise customers will be annoyed by delays and proper charges will not be made on the books, two things which should not be tolerated in a well managed business concern.

JOB ORDER DEPARTMENT.	
E. W. PECK & CO.,	
Derby, Conn. <i>July 25/02/02</i>	
Repair Leaky faucet in Kitchen	
At No.	239 Main St. Street.
Property owned by	P. G. White
Occupied by	Mrs. Smith
Charge to account of	Ges. M. Powell & Son
Order given by	E. M. P.
REMARKS	
Job	
To be done	<i>Immediately</i>

Job Order Blank.

be made in any other way. There is no excuse for a business man doing this work in a slipshod way. Good profits are derived from it, consequently it is desirable to perfect a good system which will leave no important detail unprovided for. Every tradesman in these times has to give a great deal of his attention to new work and contracts, the sale of goods and materials, but his jobbing business if carefully looked after will perhaps pay better profits in proportion to the time given and capital required than almost any other branch.

The importance of the jobbing business has led many merchants to add it to their business and to provide some special means of caring for it, and some of our readers will be interested in the method followed by E. W. Peck & Co., Derby, Conn., whose job order blank is reproduced herewith. The blank as used is $5\frac{1}{2}$ in. wide and $8\frac{1}{4}$ in. long. These blanks are in a book of the manifold type, so that when the blank is filled out one can be removed and given to the workman and the other retained to keep track of the work and to see that it is properly charged.

The blank is adapted for use in connection with jobbing of any kind, whether steam fitting, gas fitting, sheet metal work or plumbing, and the one reproduced was

BRASS MANUFACTURERS' MEETING.

THE NATIONAL ASSOCIATION OF BRASS MANUFACTURERS held its annual meeting at the Hotel Astor, New York City, on the 14th and 15th inst. More than 80 per cent. of the members were present. The question of present cost of raw materials and prices of goods was carefully considered. A committee was appointed to establish a uniform list on tubular goods, with instructions to report at the next meeting of the association. The following officers were elected for the ensuing year: President, E. F. Niedecken, Milwaukee, Wis.; Trustees: A. S. Hills, Haydenville, Mass.; E. C. Regester, Baltimore, Md.; A. D. Sanders, Chicago; W. D. McRae, Detroit, Mich.; H. F. Hodge, Minneapolis, Minn.; W. F. Schoenberger, Cleveland, Ohio. E. C. Regester, Baltimore, was appointed Eastern representative, and J. J. Ryan, Chicago, Western representative, on National Committee of Confederate Supply Associations. The next meeting of the association will be held at Milwaukee, Wis., in February.

A CALENDAR WINDOW.

THE UNION HARDWARE & ELECTRIC SUPPLY COMPANY, Providence, R. I., is planning to have a calendar show window exhibit soon after the first of the year. In this effort the company will value the co-operation of manufacturers of Hardware and kindred lines, who are requested to send copies of their calendars when issued.

L. R. MAY, who for some years has been one of the selling staff of Adolph L. Kastor & Bros., manufacturers and importers of Cutlery, has determined to retire from active business on January 1 next. Mr. May has been in the Cutlery business for the past 38 years, at different periods with Tom Cleff & Co., McCoy & Saunders, J. F. McCoy & Co., and Alfred Field & Co., previous to his connection with A. Kastor & Bros. Mr. May's retirement will be learned of with regret by a host of friends, many of whom have expressed to him a high appreciation of his business relations with them.

SEDGWICK MERCANTILE COMPANY has succeeded the Sedgwick Hardware Company, in Sedgwick, Col., and will carry a retail stock of Hardware, Furniture, Paints, Crockery, Harness, &c.

THE OHIO HARDWARE CONVENTION.

In calling attention to the Hardware exhibition feature of the annual convention of the Ohio Hardware Association, which will be held at Columbus, February 26, 27 and 28, a diagram has been issued showing the division of floor space in Memorial Hall, where the exposition will be held. On account of its unique character we reproduce this diagram herewith. It will be observed that the various aisles in the hall have been christened especially for the occasion with names of a decidedly Hardware flavor. Among the boulevards for promenading are WIRE, ROPE and CHAIN, while HARDWARE, STOVE, PITCHFORK and AMMUNITION are notable avenues. PADLOCK STREET, in view of its location, will doubtless present some interesting exhibits, while other manufacturers will have spaces on NAIL and SAW streets. The hall is admirably adapted to exhibition purposes, and the officers in charge of the convention are doing all that they can to make the display feature profitable alike to the exhibitors and to the retail merchant. Applications for space should be made without delay to J. R. Dickson, 106 North High street, Columbus, Ohio.

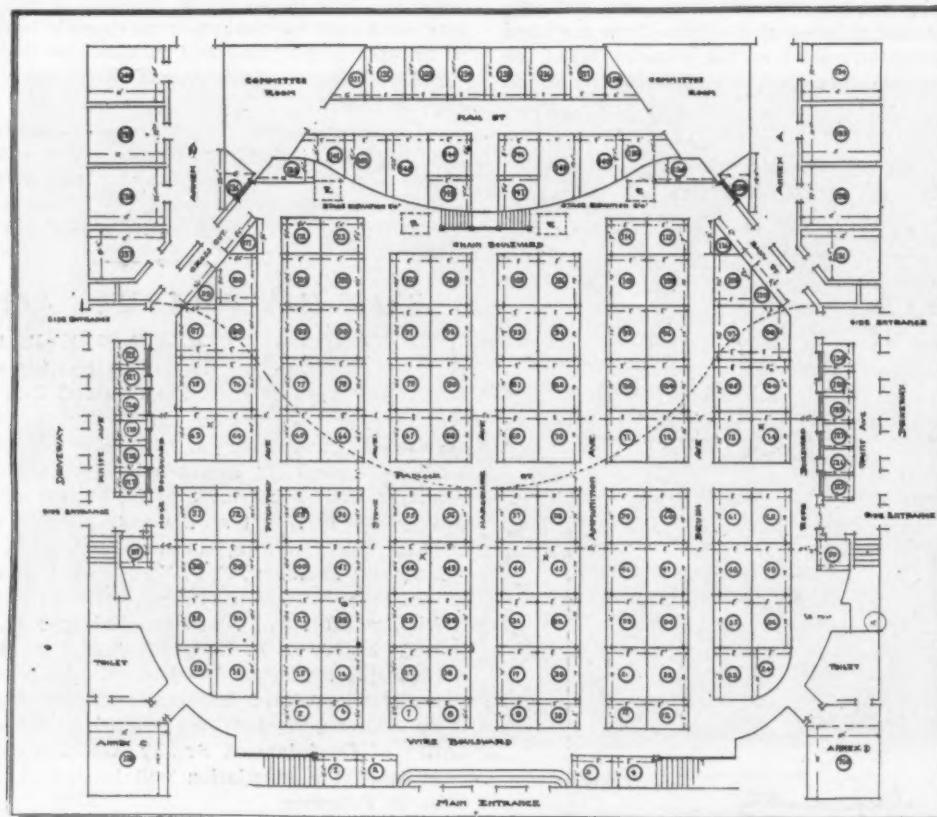


Diagram of the Exhibition Hall with Its Uniquely Named Thoroughfares.

hibitor and to the retail merchant. Applications for space should be made without delay to J. R. Dickson, 106 North High street, Columbus, Ohio.

P. & F. CORBIN, New Britain, Conn., manufacturers of Builders' Hardware, whose Chicago warehouse, sample rooms and offices were recently destroyed by fire, have resumed business in commodious quarters at 167-169 Lake street, where a stock is being rapidly accumulated. A day before the fire a mixed carload of goods was received and of course was lost, but on the day following another carload shipment was received and this forms the nucleus of the new stock, which the New Britain factories are making every effort to complete, the New York and Philadelphia warehouses of the company also co-operating.

THE plant of the Niles Mfg. Company, 14-16 North Canal street, Chicago, was destroyed by fire last week, and temporary quarters have been established at 45 West Washington street. The company manufactures Spring Hinges and Hardware specialties.

After the first of the year the company will commence jobbing this line of Tools.

FROM THEO. WILTS & Co., who have succeeded to the Hardware and Sporting Goods business of Going, Northrop & Co., Seattle, Wash.

FROM H. H. McMANN, Troy, N. Y., whose stock of Shelf Hardware, Paints, &c., was considerably damaged by fire a short time since.

FROM BROKEN ARROW HARDWARE COMPANY, which has succeeded Sprague & Parker in Broken Arrow, Okla. The company will conduct a retail business in Shelf and Heavy Hardware, Stoves, Tinware, Sporting and Athletic Goods.

FROM H. J. HEINE, who has just opened a store at Bartlesville, Ind. Ter., with a complete stock of Hardware and House Furnishing Goods.

FROM W. H. H. BONEBRAKE & SON, who have succeeded W. H. H. Bonebrake, at Marion, Iowa, in the Shelf and Heavy Hardware, Stove, Tinware, Paint and Sporting Goods business.

REQUESTS FOR CATALOGUES, &c.

The trade is given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses, with whom manufacturers may desire to communicate:

FROM R. S. MALEY, New Smyrna, Fla., who is opening a store for the sale of Hardware, Stoves, Implements, &c. Mr. Maley also has a store at Daytona.

FROM A. T. DAILEY & SON, who have engaged in the Hardware business at Whiting, Iowa.

FROM H. GOLDBLATT HARDWARE COMPANY, 1410 Grand avenue, Kansas City, Mo., who desire catalogues and quotations from manufacturers and jobbers of Plasterers', Masons' and Cement Workers' Tools and related lines.

PAINT MANUFACTURERS ON THE NORTH DAKOTA PURE PAINT LAW.

THE IRON AGE is in receipt of numerous communications from the Paint manufacturers of the country relative to the North Dakota Paint law. This statute has now been in operation long enough to afford opportunity for judging of its merits or demerits and its practical efficiency. Its provisions, as most of our readers will doubtless remember, are that Paint which contains certain specified ingredients can be sold freely within the borders of the State, but that the manufacturer who sells Paint containing other ingredients is liable to fine and imprisonment unless the label on each can or other package shows the composition of the Paint and the accurate percentages of the ingredients which have entered into it.

Extracts from the letters of several manufacturers are given below and will be found interesting as indicating the attitude toward the law of several concerns whose high reputation for responsibility and superior product are such that their views should receive careful consideration. Some of them, it may easily be believed, would derive benefit rather than injury from intelligent legislation protecting the public from inferior goods misrepresented as equal or superior to established lines of demonstrated quality.

That considerable inferior Paint has been sold in every State in the Union cannot be questioned. Whether the public should be protected from such products by legislation is open to discussion. Nearly all the manufacturers quoted oppose the law on other grounds, adducing arguments of a practical nature based on their technical knowledge and experience. It is unnecessary to call special attention to these arguments, most of which are marked by moderation, clearness and force.

UNJUST AND PATERNAL.

From Billings-Chapin Company, Cleveland, Ohio: In common with every other Paint manufacturer, we believe, we are opposed to the North Dakota Paint law, in spite of the fact that we are strong believers in the manufacture and use of the highest possible grade of Paint. The reasons for our opposition are twofold. First, the Paint law as it now stands

Works an Injustice to All Paint Manufacturers

because it compels them to expose to the public that which has cost them a very considerable expenditure of time and money to acquire—a knowledge of the best ingredients and the proportions in order to secure the best results. In behalf of the law it can truly be said that it tends to differentiate between the grossly poor Paint and the better grades of Paint. This much is a gain for the better grades, but we believe this is more than offset by the cloud that is cast upon their reputation by the inference almost any layman would make, that if the Paint does not conform to the law so as not to require that its contents be specified on the can, it is not a first-class Paint.

Law Conflicts with High Grade Paint Making.

The law and high grade Paint making come into conflict at several points, only one of which we need now enumerate lest we make our letter too long. Paint in order to look well and wear well on a house must properly fill the pores of the wood and prevent their absorbing too much of the oil. Some pigments are most desirable from the standpoint of color and durability of color, but they make poor fillers. Only a small amount is required to the gallon to cover and wear well. If more is used the oil is absorbed by the pigment and the Paint dries dead. Add lead or zinc and the shade is changed. What is needed is an inert material that will not change the shade or absorb the oil, but will fill the pores of the wood. Add this, and according to the North Dakota Paint law you must put a label on your Paint which at once proclaims it as illegal in a measure. Our second objection to the Paint law is that it

Smacks of Paternal Legislation.

It is true the low grades of Paint, of which there are many, are an injury to the Paint business, but probably no more so than the low grades of any other kind of material that are on the market, and no worse than low grade lawyers or doctors are to these professions. One cannot expect to go through life and have the law take

the place of their common sense or judgment. It is right that a premium should be set on these latter two articles and the sooner the great mass of people learn that they cannot buy gold dollars for 90 cents the better it will be for them, and the longer they remember where they get plugged dollars for their good coin and where they get good value for what they buy the better it will be for them. The more the law

Interferes with This Rational Process

of buying goods the more it would tend to make infants of us. It is right that pure food laws should be passed for the consequences are too serious of any errors in judgment that the ignorant or unwise might make in the purchase of such articles. They might be dead through the use of impure foods before they learned wisdom, but in the purchase of materials of common consumption like Paints, clothing, shoes or overshoes, the law should leave ample room for the display of common sense and opportunity for him who will give good value to acquire a reputation for doing so over him whom nothing but the law will compel to be good. We certainly object to the Paint business being almost the first target for a kind of legislation that is necessarily vicious, because it naturally puts a ban upon all goods that are not made so as not to be labeled, and probably

No Two of the Best Authorities Would Agree

exactly as to just how different ingredients should be combined so as to get the best results in color, durability of color, durability of protective properties and ease of spreading under the Brush. Perhaps we can by illustration make our position clearer, using a subject with which more people are familiar than with Paint.

Suppose a State Legislature, with a view to putting a good many charlatans out of business, were to try to legalize some cure for rheumatism and say that no physician should treat any patient in any other way except by first explaining to the patient that his method was illegal. Will any one say that there is one sure cure for rheumatism any more than there is one kind of Paint that will always produce satisfactory results? Would it not, therefore, work injustice to a great many physicians who are producing excellent results, but with systems that might not meet the sanction of a State Legislature who happened to pass laws upon the subject? If State Legislatures can handle such subjects successfully it would be much better for them to begin with some profession like this, for they would not only put some charlatans out of business, but if the relief was real they would afford it to men in their hour of need and not when they are perfectly capable of taking care of themselves.

A HELP TO IMPOSTORS.

From a Manufacturer in the Middle West: In our judgment it is still rather early to say just what will be the effect in practical working of the North Dakota Pure Paint legislation. That the intentions of the author of the bill are sincere no one who has taken up the matter with him thoroughly can question, and while he admits that the

Law Contains Defects Which Work a Hardship

to the leading and most reputable manufacturers, it is his expressed intention to have the same altered so as to make it not only protective to the people of North Dakota, but to do equal justice to all just as soon as it can be determined exactly what those changes shall be.

Ingredients vs. Proportions and Methods.

The injustice to manufacturer and consumer alike, it appears to us, comes from fostering by legal enactment the business of those who with increased profits to themselves masquerade before the public as makers of "so called pure Paints," simply because the constituent parts of their products are composed only of statutory materials, without regard to proportions which give best Paint value or proper methods of manufacture, which play such an important part in real painting economy and put a ban on the wares of the intelligent and most up-to-date makers, which cost more money and have far greater Paint value than some of those already referred to.

Fortunately for us our output has not declined in North Dakota, and it is our intention to continue marketing as in the past the most intelligently made and best prepared Paint that it is possible to do, without regard to what legal impediments may, unintentionally or otherwise, be placed in the way of best knowledge and most modern practice.

BEST PAINT HAS BENEFITED.

From a Manufacturer in Pennsylvania: Apologies for such a law have already been made by those who have

been appointed to see that the law is enforced. The framers of it have proven conclusively their ignorance of the subject of Paint manufacture, and the first bulletin issued indicates that it is not unlikely that experience will show the necessity for changes at the coming session of the North Dakota Legislature. There was an assumption on their part that a certain chemical formula should be set up and recognized as the only standard, but this has been so severely criticised, not only by Paint makers, but also by the largest consumers of Paint, that there is

Every Indication of a Change

being made in the near future. We are sure that no argument from us is necessary to convince the fair minded of the vicious nature of the legislation referred to. The article which appeared in *The Iron Age* early this year cites one of the most pertinent questions which has yet been asked in connection with the subject—namely, “But why stop at Paints?” and it seems to us that Hardware dealers and manufacturers everywhere cannot fail to take particular notice of that important phase of the question.

Agitation at Least Disseminates Knowledge.

We have suffered some inconvenience this year on account of the law, but it is a significant fact that the agitation of this subject in that State has succeeded in showing substantial gains in advancing the sale of products of those who produce the best Paint, and we have benefited in our business on that account. The general dissemination of useful knowledge concerning the latest scientific achievements in producing the most satisfactory combinations in ready mixed Paint cannot fail to further, eventually, the best interests of makers of the highest grades.

HAS INCREASED SALES OF PURE PAINT.

From a Manufacturer in Minnesota: We at first thought it would be up-hill work to keep and extend our trade in North Dakota, owing to this legislation, but after some experience we think it is

One of the Best Laws Adopted

regarding the Paint question. As you are probably aware, North Dakota is a very young State, and the influx in immigrants increases every day. The merchants in most of the new towns are new people, and they all seem to be well satisfied to take hold of the strictly pure brand of Paint. Their customers seem to be satisfied to pay a little more for the same, and we think in the long run it will be a winner. In fact, our trade has increased wonderfully since the passing of this new law. We think it

Will Keep a Lot of Cheap Paint Out

of that market. There are numbers of people who, in ordering Paint, allow the price to govern them instead of quality, and it has been very much of an injury to the dealers in that territory as well as the manufacturers who have been furnishing them with good Paints. We think catalogue houses suffer more by it than any legitimate Paint house.

ESSENTIAL FEATURES OF PAINT.

From a Manufacturer in the East: The “pure Paint” legislation of North Dakota is not particularly annoying to us. We are shipping our goods right in there—the same formula we have been using for the last 35 years, experience and science having taught us that, irrespective of how pure an article may be, the essential features about a Paint are that it must preserve and beautify.

Pure Paint Not Necessarily Good Paint.

Our Paint has longer wearing properties than any other made and we fear no law that may be enacted, as that would not change our position in the least. You can see advertised very extensively a great many brands of beer, all claiming to be pure, but that does not strengthen the fact that all pure beer is good beer. We could illustrate the matter perhaps better by taking an 18 karat gold watch; for wearing it has no comparison with the 14 karat, which is what most every one carries.

NO DISCRIMINATIONS AS TO KINDS OF PAINT.

From a Manufacturer in Illinois: We do not think this law is at all satisfactory to Paint manufacturers or that it is likely to accomplish the object intended. One of the principal objections to the law is the fact that it makes no discriminations as to the purpose for which Paint is intended, but includes House Paints, Floor Paints, Car-

riage Paints and all other Paints in one category. This, it does not seem to us, is a practical method of handling the question.

ABSURD AND FANATIC.

From a Manufacturer in the Central States: We are unable to give you any information concerning the practical working of the law, as we have had but little trade in North Dakota and are declining to make quotations to any one in that territory on account of the absurd and fanatic law referred to.

POST OFFICE LEGISLATION PROGRAMME AT WASHINGTON.

FROM OUR SPECIAL CORRESPONDENT.

WASHINGTON, D. C., November 27, 1906.

THE forthcoming annual report of the Postmaster-General will prove of great interest to the Hardware trade, and especially to retailers in all sections. It will contain important recommendations for legislation that would no doubt prove more or less injurious to the interests of retailers in all lines, but in one respect at least it will encourage merchants who have come to look upon the rural free delivery as a most important aid to the catalogue houses, particularly in sparsely settled sections where its expansion has heretofore been out of all proportion to any demands other than those of politics.

The Rate of Expansion of Rural Free Delivery Service is now on what promises to be a permanent decline. The statement was made in this correspondence more than a year ago that the annual increase in the cost of rural free delivery had reached a maximum. This meant that the wholesale and absolutely reckless extension of the service was at an end, and that henceforth the expansion would be at a rate commensurate with the growth of the country's population and not at a rate that promised to demoralize local business conditions. This prediction has been fully verified in the estimate which the Postmaster-General has prepared for the rural service for the fiscal year beginning July 1 next, which represents the smallest increase in recent years and, taken in connection with the appropriation since 1903, shows a steady downward tendency that must be gratifying not only to merchants doing business in rural communities, but to the taxpayers at large.

The Total Cost

of the rural free delivery service for the fiscal year ending June 30, 1905, was \$12,921,700, but, yielding to the pressure for an increase in the maximum rate of compensation of rural carriers from \$600 to \$720 per annum, Congress increased the appropriation for 1905 to \$21,116,600. In 1906 the appropriation rose to \$25,828,200, and for the fiscal year which began July 1 last, the amount was \$28,200,000. In the figures which the Postmaster-General's report will disclose, there will be an estimate for the rural service for the fiscal year beginning July 1, next, for which Congress appropriates at the coming short session, of \$29,675,000. The movement during the last four years is most graphically shown in the following table, which records a gratifying diminishing annual increase:

Year.	Appropriation.	Increase.
1904.....	\$12,921,700	.....
1905.....	21,116,600	\$8,194,900
1906.....	25,828,300	4,711,700
1907.....	28,200,000	2,371,700
1908.....	29,675,000	1,475,000

Postal officials predict that next year's estimate for the increased cost of the rural service will closely approximate a million dollars and that thereafter the service will show only

A Normal Expansion

in keeping with the increase in population, and ranging between 3 and 4 per cent. per annum. The current expenditures for increased service are now about equally divided between the establishment of routes in what may be called virgin territory, and in the completion of county service in sections where a relatively large number of

routes have heretofore been authorized. In going into new territory the Department requires far more conclusive evidence as to the necessity for the establishment of routes than was demanded under the Machen régime, and it is probable that the retail merchants in rural communities will never again be called upon to witness the installation of large numbers of routes in sparsely settled districts as was the case when Superintendent Machen was at the helm. In fact, the Department is now slowly discontinuing superfluous routes established from time to time, and hopes at a comparatively early date to reduce the service to an absolutely normal basis.

Present Status of R. F. D. Service.

The Post Office Department has furnished the correspondent of *The Iron Age* with a table showing the present condition of the rural free delivery service and the number of routes established during the period from July 1 to November 1 of the current year, which gives an excellent idea of the present tendency in the service. There were in operation on July 1 35,766 routes, and during the four months to November 1 1019 additional routes were established, making a total of 36,785 routes. During the same period 101 routes were discontinued, or at the rate of more than 300 per annum. Illinois holds the lead for the largest number of routes in operation on November 1, being credited with 2744. Ohio stands second with 2475, Iowa with 2296 and Indiana with 2131. The following table shows the number of routes in operation on July 1 and on November 1 in the 15 States in which more than 1000 routes have been established:

States.	Established July 1.	Total routes November 1.
Georgia	1,381	1,411
Illinois	2,693	2,744
Indiana	2,105	2,131
Iowa	2,266	2,296
Kansas	1,556	1,598
Michigan	1,813	1,918
Minnesota	1,382	1,475
Missouri	1,825	1,873
New York.....	1,722	1,739
North Carolina.....	1,152	1,175
Ohio	2,440	2,475
Pennsylvania	1,986	2,006
Tennessee	1,584	1,544
Texas	1,525	1,567
Wisconsin	1,450	1,494

There has recently been a rapid increase in the number of routes established in the Southern States, a fact which the catalogue houses have been quick to take advantage of, and, as has frequently been pointed out in *The Iron Age*, these big concerns are now devoting special efforts to building up their trade in the South and Southwest.

Parcels Post Will Not Be Recommended.

Though urged to recommend the adoption of a parcels post in his forthcoming report Postmaster-General Corryou has decided not to do so. What postal reforms would have been recommended had the Department's plans been given more favorable consideration by Congress last winter can not be stated. It will be remembered that an estimate of \$10,000 was submitted to pay the expense of a commission of three officials of the Department to go to Europe to investigate the postal systems of the leading countries. The House Committee declined to include this item, but the Senate put it in. In Conference Committee, however, it was strongly opposed by Chairman Overstreet and his colleagues, and the Senate conferees finally yielded, thus striking out the desired sum. As the result the Department has not been able to secure the data it desired as a basis for the recommendation of a number of reforms in postal method. That an experimental parcels post would have been included in this category is possible; however that may be, it will be a source of general satisfaction that the House Committee took a firm stand in the matter.

The Project for the Consolidation

of third and fourth class mail matter, which would reduce the rate on merchandise from 16 to 8 cents per pound, is the most important issue to be met by retail

merchants at the coming session, as it will again be urged, not only by Third Assistant Postmaster-General Madden, but by the Postmaster-General. Its true significance, however, is far better understood in Congress, and especially in the House, than formerly. On one occasion, indeed, the House Committee was on the point of accepting such a provision incorporated by the Senate Committee, but the campaign of education undertaken by retail interests throughout the country culminated at a critical time, with the result that the amendment was rejected.

Postal Check Currency Schemes.

Readers of *The Iron Age* will remember that a very comprehensive postal check currency scheme was presented to Congress last winter by the Postmaster-General, after the Post Office Appropriation bill had reached the Senate committee. This project was devised by a special commission, the most active member of which was First Assistant Postmaster-General Hitchcock. Mr. Post, the inventor of the so-called Post check currency, was given a hearing on his plan, but ultimately both projects were turned down. Certain postal "reformers" are now preparing to bring forward independent bills authorizing postal check currency systems, and as the Postmaster-General and Mr. Hitchcock will strongly advocate such a currency in their forthcoming reports the retailers must prepare for another sharp fight.

W. L. C.

PRICE-LISTS, CIRCULARS, &c.

Manufacturers in Hardware and related lines are requested to send us copies of catalogues, price-lists, &c., for our catalogue department in New York; and at the same time to call attention to any new goods or additions to their lines, of which appropriate mention will be made, besides the brief reference to the catalogue or price-list in this column.

WALLINGFORD MFG. COMPANY, Wallingford, Vt., John H. Graham & Co., selling agents, 113 Chambers street, New York: Handsome illustrated catalogue and price-list referring to an extensive line of Hand Farming and Garden Tools, Grass and Corn Hooks, &c.

TOLEDO CARRIAGE WOODWORK COMPANY, Toledo, Ohio: 1907 catalogue and price-list, covering an extensive line of Poles, Shafts, Bows, Hubs, Rims, Spokes, &c., with circular giving practical suggestions for making up orders.

LEADER EVAPORATOR COMPANY, Burlington, Vt.: "The Sugar Makers' Guide," a booklet referring to Leader Evaporators, Monitor Gathering Tanks, and other sugar makers' utensils.

BROWN OIL CAN COMPANY, Toledo, Ohio: Catalogue No. 11; an attractive edition of 100 pages, containing illustrations, descriptions and price-lists of Brown's High Grade Metal Ware, Antirusting Goods, Gas Stoves, &c.

TOLEDO WHEELBARROW WORKS, Toledo, Ohio: 1906-1907 catalogue with illustrations and price-lists of Wheelbarrows of all kinds, including Garden, Contractor, Railroad, Brick, Mortar, Stone, &c.

LANCASER FORGE & BLOWER COMPANY, Buffalo, N. Y.: Catalogue No. 28, referring to Forges, Blowers, Drills, Tire Upsetters, Angle Cutters, Punches and Shears.

G. E. Meyer & Son, retail Hardware merchants, South Bend, Ind., have leased a three-story brick building at 117 West Jefferson street, 80 ft. long and 40 ft. wide, and will move from their present quarters at 117 North Michigan street about the middle of January. The store front will be remodeled. The entire first floor will be used for salesroom. The tin shop and cornice department will be located on the second floor, and on the third floor and in the basement stocks will be carried.

J. D. Stell, successor to G. T. Williams, Scranton, Texas, was burned out on the very day that he took over the business. He is rebuilding and expects to be ready for business again in a few days.

AN EXAMPLE OF SAN FRANCISCO PLUCK.

PRIOR to the great earthquake and conflagration in San Francisco in April last the Palace Hardware Company had one of the finest retail establishments in the city. With its destruction the company with characteristic courage and energy turned its attention to the future and looked about them with a view to getting back into business as quickly as possible. The present location, 456 and 458 Golden Gate avenue, was contracted for within 10 days after the fire. Indeed the first load of lumber hauled through that thoroughfare was for the Palace store. In the absence of a catalogue or other guide, goods were ordered entirely from memory. The company also had goods of considerable value in transit at the time of the fire. Within a week after the conflagration had spent itself, notices from the transportation companies began to come in, noting the arrival of goods accompanied with requests to take care of them. This was not an easy

AMONG THE HARDWARE TRADE.

G. O. Fairchild has succeeded to the Hardware, Stove, Implement, Vehicle and Harness business of G. O. Fairchild & Co., Bertrand, Neb.

J. C. Smith has sold his Hardware, Stove, Paint and Sporting Goods business in Tekamah, Neb., to E. W. Shafer Hardware Company, and has opened another store in Elk City, Okla.

Bosse & Brodie, Ellenwood, Kan., have sold their Hardware and Implement business to C. Kattenhorn & Son.

McManus Implement & Vehicle Company, Waxahachie, Texas, has been succeeded by Hardy P. Mizell Company.

By purchasing the interest of the late August Erath, the Voorhies Hardware Company has acquired the Hardware, Stove, Paint, Plumbing and Sporting Goods busi-



A San Francisco Hardware Store Completed 60 Days After the Fire.

thing to do, but warehouse facilities were secured after a brief interval. This warehouse filled the bill nicely for a week, at the end of which time its capacity had become fully taxed, and no more goods could be accommodated there. Diligent search failed to discover another eligible warehouse, but just at this point the company had the floor partly laid in its new quarters, and so it was decided to store further incoming stock in the basement. To guard against thieves watchmen were employed night and day. In fact, the firm was doing business right along while the building was in course of construction, with no roof overhead for two or three weeks. This was a rather crude and awkward way of selling Hardware, but the company, plucky and persevering, managed to live through it and to keep in perfect touch with its trade.

A view of the interior of this interesting and, when the circumstances of its construction are considered, very creditable store is presented herewith. It will be observed that it is conveniently arranged and neatly furnished. The building is of brick with frame front, one story, 57 ft. 6 in. wide and 120 ft. long. The basement corresponds in dimensions with the store, and being 10 ft. high, provides space for storing a lot of goods. The company is carrying the same lines and selling as high class goods as formerly.

ness formerly conducted by the Erath Hardware Company, New Iberia, La.

MISCELLANEOUS NOTES.

The New Winchester High Power Model 1907 Self-Loading Rifle.

The Winchester Repeating Arms Company, New Haven, Conn., is putting on the market a new high power rifle which shoots a cartridge of .351 caliber, with 180 grain bullet, having a muzzle velocity of 186 feet per second and a penetration of 26% in. pine boards, when used with metal patched bullets, and of 13% in. boards when used with soft point bullets. Although this cartridge is quite small it is very powerful in execution, and is recommended by the manufacturer for use in hunting the largest game. The rifle has the model 1905 self-loading principle. It holds six shots, five of which are loaded into the magazine, which is detachable and can be inserted in the gun when the bolt is closed. There are no moving projections on the outside of the gun and no screws. The barrel is stationary and the sights are attached directly to the barrel. It has a simple take-down device which allows the gun to separate into two portions, the stock and action being in one part and the

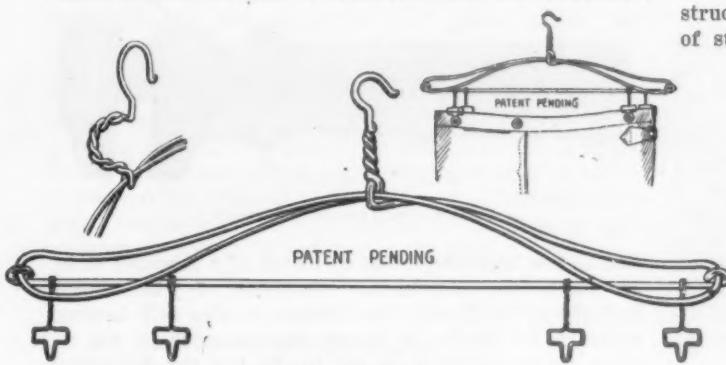
barrel and receiver in the other, making it easy to clean. The barrel is 20 in. nickel steel, pistol grip stock and weighs about 7½ lb.

The Edwards Mfg. Company.

The Edwards Mfg. Company, 440-460 Eggleston avenue, Cincinnati, Ohio, is offering the Imperial valley for shingle roofs. It is made of the best quality of galvanized steel in 10-ft. lengths, and it is referred to as free from the annoying possibility of cracking, caused by the contraction and expansion of the metal. A new and interesting catalogue has recently been issued by the company which combines the features of two previous catalogues, one describing architectural sheet metal work and the other stamped steel ceilings. The catalogue, which contains 168 pages, also has many new illustrations, and the care taken in its compilation, with the careful rearrangement of the matter, is calculated to make it valuable to sheet metal workers generally. Among the goods shown are conductor pipe and eave trough, ornamental shoes and gargoyle, ornamental roof cresting, ready roofing, corrugated roofing, door casings, metal lath, corrugated steel awnings, metal ceilings, cornices, finials, balusters, rosettes, capitals, animal heads, cartouches, &c.

Button Loop Set.

C. K. Hutchins Company, Buffalo, N. Y., is offering a novelty in the Button Loop hanger which consists of a polished nickel rod of No. 9 wire with a ring in the center to hang it by and four wire loops on which a pair of trousers may be hung by the suspender buttons right side up, thus preventing change and other articles from falling out of the pockets. The use of the device will be clear from the accompanying illustration, which also shows what the company terms its Button Loop Set, comprising



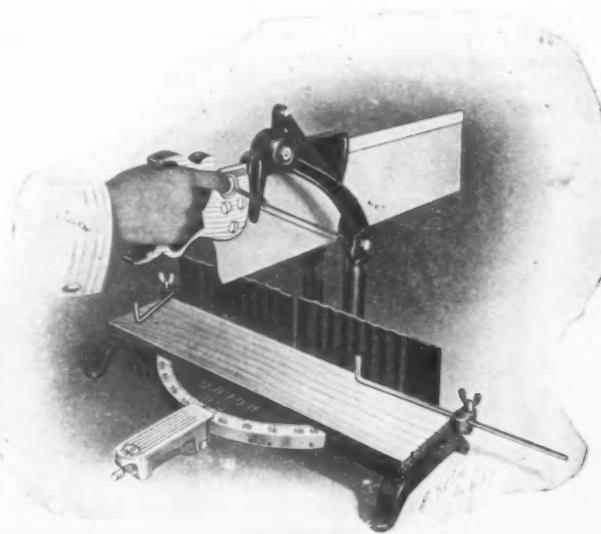
Button Loop Set.

a shoulder shape, offset coat hanger with trousers hanger attached. The latter sells separately for 10 cents, and the set complete for 25 cents.

The Union Miter Box.

The Dosch Mfg. Company, Bridgeport, Conn., is offering the miter box herewith illustrated. It has an absolutely open front, and there are no standards in front to hold the saw, which is held by a saw guide which is milled its entire length. This feature admits of increased width of square and miter cuts. The largest of the six sizes in which the box is made will cut a board up to 20 in. wide off square; or a miter up to 16 in. When the saw is not in use it is held above the work by a lock, which is controlled by the locking pawl rod, through which the first finger is passed, as shown in the illustration. When wanted for use, the saw, with the saw guide, is released by pulling on the rod, and then drawn toward the operator, down upon the work. By pressing together the handle and lever, in front of the graduated plate, a lock is released and the box can be set to any degree or half degree, where it will hold without slipping. By turning a screw in the rear of the vertical post the saw can be set to cut to a required depth, and the saw cutting the same depth both in front and back

is of great service in sawing tenons, dadoes, &c. The adjusting rods, one of which is shown at each end of the box, can be easily set to cut boards to definite lengths, or for cutting crown moldings, segments, &c. The graduated plate is nickelized brass; the swinging arms and verti-



The Union Miter Box.

cal posts are malleable iron, the back of the box is pressed steel and the whole construction is referred to as being correct and exceptionally strong for a tool of its kind.

Knoxall Tank Heater.

A tank heater styled the Knoxall, which is so constructed that it will remain in position without the use of stay rods, and shown in the accompanying illustra-



Knoxall Tank Heater.

tion, is now being placed on the market by Hunt, Helm, Ferris & Co., Harvard, Ill. Its shape permits of the use of almost any kind of fuel, and it is furnished with an outside draft, cast iron ash pan, basket grate, shovel and one length of pipe. It is adapted for both wood and steel tanks, has a height of 24 in., and its shipping weight is 150 lb.

Maine Mfg. Company, Nashua, N. H., maker of the well-known White Mountain refrigerators and other brands is this year devoting increased attention to its Stone White line, which it has enlarged and improved. These refrigerators are lined with solid white stone, mined in the company's own quarries, which is tough and durable and will easily withstand the rough handling incident to long shipments. As the stone is almost ice cold itself, it is said to be especially calculated to keep the provision chamber at a low temperature, thus insuring a saving of ice. It is also remarked that the joining of the slabs is accomplished so skilfully as to give the effect of a chamber drilled from one solid block of stone. By the process of finishing the surface is brought to a high permanent white gloss which is both handsome and cleanly. The wood and metal work and trimmings of the Stone White chests are declared to be of the highest

Klingtite Connection.

The accompanying illustrations represent a device for quickly attaching and detaching portable shower baths, shampoo sprays, faucet filters, water motors, hose, &c., to and from smooth bibbs and similar fixtures designed to assure positive connections under all conditions and for an indefinite period regardless of the varying pressure of the flowing liquid. James Mfg. Company, Frick

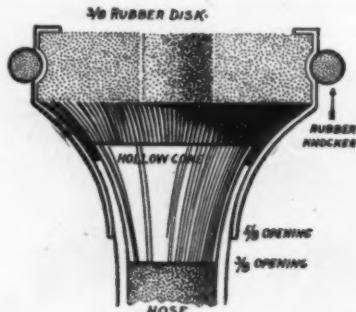


Fig. 1.—Klingtite Quick Hose Connection.

Building, Pittsburgh, Pa., with Western offices, 1939 Broadway, Denver, Colo., is placing the device on the market. In Fig. 1 is shown the quick hose connection, actual size, for $\frac{3}{8}$ -in. rubber tubing. The hose is attached to the connection by simply pushing its end through a $\frac{5}{8}$ in. opening and over the hollow cone to secure an absolutely tight joint, which becomes more effective by increased pressure or any lateral strain. The connection

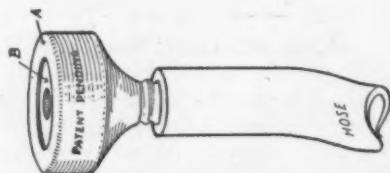


Fig. 2.—Connection with Standard Hose Pipe Threads.

is also furnished with standard hose pipe threads at the lower end, in lieu of the hollow cone to which standard connections may be attached, and also with a bead at the lower end, so that it may be attached to hose in the ordinary way, as shown in Fig. 2. The casing is spun from sheet aluminum or brass nickel plated, highly polished. A positive connection is said to be obtained by sliding the rubber disk end over the faucet with a slight degree of friction, which is increased by back pressure of the

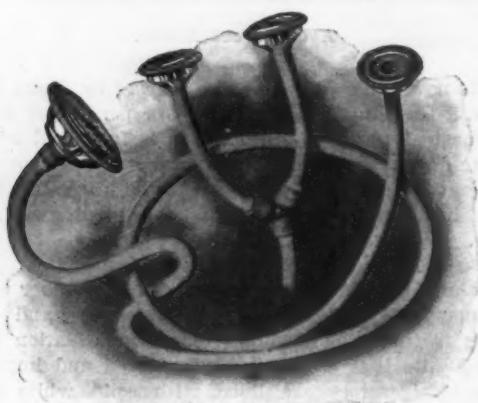


Fig. 3.—Connection with Bath Sprays.

passing liquid or gas, whereby the rubber disk grips the faucet more tenaciously as the pressure increases. It is pointed out that frequent attachment and removal does not lessen its efficiency in the least, as any possible wear is taken up by the internal pressure. In Fig. 3 bath sprays are shown equipped with the quick hose connections, as already described, and made from extra heavy rubber tubing to withstand the full force of ordinary city

water pressure. In Fig. 4 is shown another application of Fig. 1 in the form of a quick hose coupler, the female end of which is almost identical with Fig. 1, with the exception that the surface lines are parallel, both male and female ends being attached to the end of the hose, as in Fig. 1, thus obviating the necessity of tools, clamps, bands or wire. To secure a positive connection one end may be easily and quickly slid over the other. A leakage is said to be impossible, and all joints become tighter as the pressure increases. This style of hose coupler is of

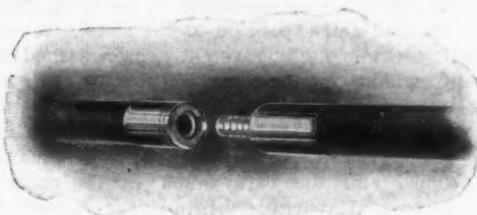
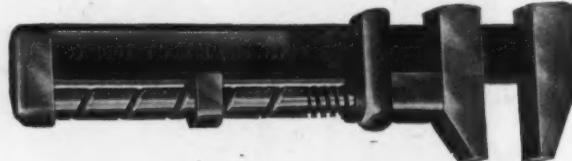


Fig. 4.—Another Form of Quick Hose Coupler.

especial advantage in connection with compressed air and vacuum lines, and also wherever it is necessary to make and break a line frequently and quickly. Means are also provided to prevent the uncoupling of hose by any external lateral strain greater than the internal pressure, and also for attachment to standard hose bibbs and standard nozzles.

The Noyes Automatic Wrench.

In presenting the Noyes Automatic All Steel Wrench to the trade the Mason Wrench & Tool Company, First National Bank Building, Chicago, directs special attention to the ease and rapidity of the jaw adjustment. As shown in the accompanying illustration, the movement of the double threaded reversible screw controlling the



The Noyes Automatic Wrench.

sliding jaw is accomplished by means of a threaded slide, the downward and upward movement of which opens and closes the jaws. The wrench is also self locking, although its release is almost instantaneous by the removal of the pressure on the handle and the downward movement of the slide. It is substantially constructed, the end piece being fitted into the handle, and is made up of only five parts. It is furnished in four sizes, 6, 8, 10 and 12 in.

Adjustable S Wrench.

Bemis & Call Hardware & Tool Company, Springfield, Mass., has recently made noteworthy improvements in its No. 48 Adjustable S Wrench, illustrated herewith. The wrench is made considerably thinner, thus adapting it for use on thin nuts or check nuts where a drop forged



Adjustable S Wrench.

end wrench would be used. A change has also been made in the size of the adjusting nut, making it easier to operate. The casting of the letters B. & C. on the reverse side of the wrench is to distinguish it from tools of other makes.

The I. X. L. Truck.

O. P. Schriver & Co., Cincinnati, Ohio, are putting on the market a truck with chain arrangement shown herewith. The chain permits handling ash cans, garbage barrels, &c., without the contents falling out. It allows the lid to remain on, or, if there is no lid, a piece of old carpet or sacking can be thrown over the can or barrel, which the chain will hold in place. Additional points of ex-



I. X. L. Truck, Loaded.

cellence are mentioned, as follows: That the chain arrangement saves wear and tear on cans or barrels, as the chain is clamped around the outside, there being no clamping devices inside the rim to tear or rack the can or barrel; that the chain draws the barrel toward the truck from the opposite side, bringing the leverage so that one person can draw the barrel over instead of two; that the chain makes it almost impossible for a barrel to roll off the truck when going over rough or uneven places, and that the clamp to which the chain is attached slides on the double bars of the truck, so that it can be raised or lowered for different heights of boxes or barrels. The truck weighs but 17 lb., avoiding the pushing of any unnecessary weight in addition to the load.

PAINTS, OILS AND COLORS

Animal, Fish and Vegetable Oils—		Miscellaneous—			
Bartley's		White, Foreign	\$18.50@20.00	Blue, Ultramarine	13 @16
Linseed, City, raw	42 @43	Amer. floated	19.00@2.	Brown, Vandyke	11 @14
City, Boiled	43 @44	Off color	ton 11.50@15.50	Green, Chrome	12 @16
State and Western, raw	41 @42	Chalk, in bulk	ton 3.00@3.25	Paris	2 @32
New Calcutta, in bbls.	70 @71	In bbls.	100 lb. @1.	Sienna, Raw	12 @15
Lead Extra Prime, W. Mer.	76 @77	China Clay, English	ton 11.00@17.00	Sienna, Burnt	12 @15
Extra No. 1	51 @52	Cobalt, Oxide	100 lb. 2.50@2.60	Umber, Raw	11 @14
Cotton-seed, Crude, f.o.b. mills	45 @49	Whiting, Commercial	100 lb. 4.50@4.8	Umber, Burnt	11 @14
Summer Yellow, Primo	41 @43	Gilders	100 lb. .50@.55		
Summer Yellow, ⁴ grades	@	Ex. Gilders	100 lb. .50@ .00		
Sperm, Crude	52 @53				
Natural Sprit					
Bleached Spring					
Natural Winter	65 @66				
Bleached Winter	68 @69				
Bleached Winter, Extra	70 @72				
Tallow, Prime	50 @51				
Whale, Crude	35 @36				
Natural Winter	45 @46				
Bleached Winter	47 @48				
Extra Bleached Winter	49 @50				
Menhaden, Brown, Strained	32 @33				
Light, Strained	32 @33				
Bleached, Winter	@				
Extra Bleached, Winter	@				
Southern	27 @				
Cocoanut, Ceylon	lb. 9%@				
Cochin	lb. 9%@				
Cod, Domestic, Prime	31 @32				
Newfoundland	34@36				
Red, Elaine	48 @51				
Saponified	lb. 6%@ 7				
Olive, Italian, bbls.	65 @70				
Neatsfoot, Prime	49 @50				
Palm, Logos	lb. 74@75				
Mineral Oils—		Putty, Commercial—		White Lead, Zinc, &c.—	
Black, 29 gravity, 25@30 cold test	10@11½	In bladders	\$1.70 @1.85	Lead, English white, in Oil:	lb. %@10
29 gravity, 15 cold test	11½@12½	In bbls. or tubs	1.20 @1.40	Lots of 500 lb. or over	@ 7½
Summer	10@11½	In 1 lb. to 5 lb. cans	2.65 @2.95	Lots less than 500 lb.	@ 7½
Cylinder, light filtered	12 @13	In 12½ to 50 lb. cans	1.50 @1.70	In Barrels	@ 4½
Dark filtered	16 @17			Lead, White, in oil, 25 lb tin	
Paraffine, 95-97 gravity	13@14			pails, add to keg price	%
95 gravity	12@13			Lead, White, in oil, 12½ lb tin	%
95 gravity	10@10½			pails, add to keg price	%
Red	12@14			Lead, White, in oil, 1 to 5 lb	1
				ass'ted tins, add to keg price	1½
				Lead, American. Terms: For 10½	1½
				tons and over, 6% rebate, and 2% for	
				cash paid in 15 days from date of	
				invoice; for lots of 500 lbs. and over,	
				2% for cash if paid in 15 days from	
				date of invoice, for lots of less than	
				500 lbs. net.	lb.
				Lead, White, Dry, in bbls.	6½@ 6%
				Zinc, American, dry	5½@ 5%
				Zinc, French	
				Antwerp, Red Seal, dry	8%
				Antwerp, Green Seal, dry	10%
				Paris, Red Seal, dry	9½
				Paris, Green Seal, dry	11
				Zinc, V. M. French, in Poppy Oil:	
				Green Seal;	
				Lots of 1 ton and over	13½@13%
				Lots of less than 1 ton	13½@13%
				Zinc, V. M. French, in Poppy Oil:	
				Red Seal;	
				Lots of 1 ton and over	11½@12%
				Lots of less than 1 ton	12½@12%
				Discounts—French Zinc—Discounts	
				to buyers of 10 bbl. lots of one or mixed	
				grades, 12½ to 25 bbls., 2%; 50 bbls., 4%.	
Colors in Oil—		Dry Colors—			
Black, Lampblack	12 @14	Black, Carbon	6½@10	Black, Ivory	16 @20
Blue, Chinese	34 @36	Black Drop, American	4 @ 6	Lamp, Cork	4½ @ 6
Blue, Prussian	32 @36	Black Drop, English	5 @ 15	Blue, Celestial	2 @ 32
				Blue, Chinese	2 @ 30
				Blue, Prussian	2 @ 30
				Blue, Ultramarine	14½@16
				Brown, Spanish	14½@ 1
				Carmine, No. 40	\$3.00@5.00
				Green, Chrome, ordinary	3½@ 4
				Green, Chrome, pure	17 @ 25
				Led, Red, bbls., 2 bbls. and kegs:	
				Lots 500 lb. or over	@ 7½
				Lots less than 500 lb.	@ 7½
				Litharge, American, bbls.	7½@ 12
				Ocher, American	\$8.50@16.00
				American Golden	2½@ 3½
				French	1½@ 2
				Foreign Golden	3 @ 4
				Orange Mineral, English	10 @ 12
				French	10@12
				German	8½@10
				Indian, English	8½@ 8½
				American	3 @ 4
				Red, Turkey, English	4 @ 10
				Red, Tuscan, English	4 @ 10
				Red, Venetian, Amer.	100 lb. \$0.50@1.25
				English	100 lb. \$1.15@1.75
				Sienna, Italian, Burnt and Powdered	3 @ 4
				Italian, Raw, Powdered	3 @ 4½
				American, Raw	1½@ 2
				American Burnt and Pow'd	1½@ 2
				Tale, French	ton \$17.00@26.00
				American	ton 17.00@26.00
				Terra Alba, French	100 lb. 90@ 100
				English	100 lb. 90@ 100
				American	100 lb. No. 1, 75@ 80
				American	100 lb. No. 2, 60@ 70
				Umber, They, Bot. & Pow.	2½@ 3½
				Burnt, American	14@ 2
				Raw, American	14@ 2
				Yellow Chrome	12 @14
				Vermilion, American Lead	10 @ 22
				Quicksilver, Milk	50@ 60
				Quicksilver, Bals.	50@ 60
				English, Imported	5 @ 6
				Chinese	\$0.20@ 0.50

Current Hardware Prices.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33 1/2 @ 33 1/2 & 10% signifies

that the price of the goods in question ranges from 33 1/2 per cent. discount to 33 1/2 and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1906, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—

Domestic, # doz.	\$3.00.....	33 1/2%
North's	10%	
Zimmerman's—See Fasteners, Blind.		

Window Stop—

Ives' Patent.....	35%
Taft's Perfection.....	35%

Ammunition—See Caps, Cartridges, Shells, &c.

Anti-Rattlers—

Fernal Mfg. Co. Burton Anti-Rattlers, # doz. pairs, Nos. 1, 2, 75; 2, \$0.60; 4, \$1.00; 5, \$0.50.	
Fernal Quick Shifter, # doz. pairs.....	\$2.00 each.

Anvils—American—

Forge Anvils.....	# lb @ 8 1/2%
Hay-Budden, Wrought.....	9 1/2@9 1/2%
Trenton	9 1/2@9 1/2%

Imported—

Peter Wright & Sons, # lb, 84 to 340 lb, 11¢; 350 to 600 lb, 11 1/2¢	
Anvil, Vise and Drill—Miller Falls Co., \$18.00.....	15&10%

Apple Parers—See Parers, Apple, &c.

Aprons, Blacksmiths'—

Livingston Nail Co.	33 1/2%
Augers and Bits—	

Com. Double Spur.....	75@75&10%
Jennings' Patn., reg. finish.....	60@60&10%

Black Lip or Blued.....	65@65&5%
Boring Aug., Augers.....	70@10%

Car Bits, 12-in. twist.....	50@10%
Ford's Auger and Car Bits.....	40@10%

Ft. Washington Auger Co., Cards'.....	35%
Forster Pat. Auger Bits.....	25%

C. E. Jennings & Co.: No. 10 ext. lip, R. Jennings' list.....	25%
No. 30, R. Jennings' list.....	40@10%

Russell Jennings'.....	25@10%
L'Hommedieu Car Bits.....	15%

Mayhew's Countersink Bits.....	45%
Pugh's Black.....	25%

Pugh's Jennings' Pattern.....	30%
Snell's Auger Bits.....	40%

Snell's Bell Hangers Bits.....	60%
Snell's Car Bits, 12-in. twist.....	60%

Snell's King Auger Bits.....	50%
Wright's Jennings' Bits.....	50%

Wright's Jennings' Bits.....	50%
Blit Stock Drills—	

See Drills, Twist.	
Expansive Bits—	

Clark's small, \$18; large, \$26.....	50&10%
Clark's Pattern, No. 1, # doz.....	25%

No. 2, \$18.....	60@10%
Ford's Clark's Pattern.....	60%

C. E. Jennings & Co., Steer's Pat.	25%
Lavigne Pat., small size, \$18.00; large size, \$26.00.....	50@10%

Swan's Gimlet Bits—	
Per gro.	

Common Dble. Cut.....	\$3.00@3.25
German Pattern, Nos. 1 to 10, 44.75; 11 to 13, \$5.75	

Hollow Augers—	
Bonney Pat., per doz.....	\$5.50@6.00

Ames	25@10%
Universal	20%

Wood's Universal.....	25%
Ship Augers and Bits—	

Ship Augers.....	45@5@—%
Ford's	35@4@—%

C. E. Jennings & Co.: L'Hommedieu's	15%
Watrous'	35@4@—%

Snell's	40%
Awl Hafts—See Handles, Mechanics' Tool.	

Awls—	
Handled	gro. \$2.75@3.00

Unhandled, Shildered.....	gro. \$3.00@3.60
Unhandled, Patent.....	gro. \$6.00@7.00

Peg Awls:	
Unhandled, Patent.....	gro. \$1@2 1/2¢

Unhandled, Shildered.....	gro. \$5@7.00
Scratch Awls:	

Handled, Com.	gro. \$3.50@4.00
Handled, Socket.....	gro. \$11.50@12.00

Awl and Tool Sets—See Sets, Awl and Tool.	
Axes—	

Single Bit, base weights: Per doz.	
First Quality.....	\$1.75@5.00

Second Quality.....	\$1.25@4.50
Double Bit, base weights:	

First Quality.....	\$7.00@7.50
Second Quality.....	\$6.50@6.75

Axle Grease—

See Grease, Axle

Axes—

Iron or Steel

Concord, Loose Collar.....	45@5%
Concord, Solid Collar.....	45@5@5 1/2%

No. 1 Common, Loose.....	34@4@
No. 1½ Com., New Style.....	34@4@

No. 2 Solid Collar.....	34@4@4 1/2%
Half Patent.....	

Nos. 7, 8, 11 and 12.....	70@75%
Nos. 13 to 14.....	70@75%

Nos. 15 to 18.....	75@75@5%
Nos. 19 to 22.....	75@75@5%

Nos. 23 to 26.....	75@75@5%
Nos. 27 to 30.....	75@75@5%

Nos. 31 to 34.....	75@75@5%
Nos. 35 to 38.....	75@75@5%

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Screw Hook and Eye:	
$\frac{1}{4}$ to 1 inch.....	.lb. 6 $\frac{1}{4}$
$\frac{1}{2}$ inch.....	.lb. 7 $\frac{1}{4}$
$\frac{1}{2}$ inch.....	.lb. 8 $\frac{1}{4}$
Hitchors, Stall—	
Covert Mfg. Co., Stall Hitchers.	.30&2%
Hods—Coal—	
Inch.....	15 16 17 18
Galv. Open.....	\$2.50 2.75 3.00 3.25
Jap. Open.....	\$1.90 2.10 2.25 2.50
Galv. Funnel.....	\$3.00 3.30 3.60 3.90
Jap. Funnel.....	\$2.45 2.65 2.85 3.00
Masons' Etc.—	
Cleveland Wire Spring Co.:	
Steel Brick, No. 162.....	each \$1.05
Steel Mortar, No. 158.....	each \$1.35
Hoes—Eye—	
Scovil and Oval Pattern.....	60&10@60&10% 60&10@60&10%
Grub, list Feb. 23, 1899.....	70&10@75&10%
D. & H. Scovil.....	.30%
Handled—	
NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1898, or selling at net prices.	
Cronk's Weeding, No. 1, \$2.75; No. 2, \$2.50	
Star Double Bit.....	\$3.20
Ft. Madison Cotton Hoe.....	10&10@19&10%
Ft. Madison Crescent Cultivator Hoe.....	70&10%
W. doz. Mattock Hoe: Regular Weight.....	.90 doz. 65&10%
Junior Size.....	.90 doz. 61&10%
Ft. Madison Sprouting Hoe, No. doz. 59%	
Ft. Madison Dixie Tobacco Hoe, No. doz. 59%	
Kretzinger's Cut Easy.....	70&10%
Warren Hoe.....	45&10%
W. & C. Ivanhoe.....	15&2
B. B. 6 in. Cultivator Hoe.....	33.15
B. B. 6 $\frac{1}{2}$ in.	33.35
Acme Wedding.....	.90 doz. net, \$1.35
W. & C. L. T. L. T. Shovel Hoe, No. doz. 41.2	
Hoisting Apparatus—	
See Machines, Hoisting.	
Holders—Bit—	
Angular, P. doz. \$34.00.....	45&10%
Door—	
Bardsley's, Iron, 40%; Brass and Bronze.....	35&10%
Empire.....	50%
Pullman.....	35&10%
Superior.....	35&10%
File and Tool—	
Nicholson File Holders and File Handles.....	33&10@40%
Fruit Jar—	
Triumph Fruit Jar Holder, P. gross, \$10.80; P. doz.	\$1.25
Trace and Rein—	
Fernald Double Trace Holder, P. doz.	\$1.25
pairs Rein Holder, P. doz. pairs.	\$1.25
Hones—Razor—	
Pike Mfg. Co., Belgian, German and Swaty.....	40%
Hooks—Cast Iron—	
Bird Cage, Reading.....	40%
Clothes Line, Reading List.....	40%
*Clothes Line, Stowell's.....	70&2
Coat and Hat, Reading.....	45&20
Coat and Hat, Stowell's.....	70&2
Coat and Hat, Wrightsville.....	55
Harness, Reading List.....	40%
Harness, Stowell's.....	60%
School House, Stowell's.....	70&2
Wire—	
Belt.....	80&10@
Wire C. & H. Hooks.....	75&10@75&10@10%
Columbian Hdw. Co., Gem.....	70&10%
Parker Wire Goods Co., King, Jap. & 10%	
Western W. G. Co., Molding.....	75&2
Wire Goods Co.: Acme, 60&10%; Chief, 70%; Crown, 75%; Czar, 65%; V Brace, 75%; Czar Harness, 50&10%.	
Wrought Iron—	
Box, 6 in., per doz., \$1.00; 8 in., \$1.25; 10 in., \$1.50.	
Cotton.....	doz. \$1.05@1.25
Wrought Staples, Hooks, &c.—	
See Wrought Goods	
Miscellaneous—	
Hooks, Bench, see Stops, Bench.	
Bush, Light, doz. \$4.75; Medium, \$5.35; Heavy, \$6.25	
Grass, best, all sizes, per doz. \$1.00	
Grass, common grades, all sizes, per doz.	\$1.30
Whistetree.....	lb. 5%@6
Hooks and Eyes:	
Brass.....	60&5@60&10@65%
Malleable Iron.....	70&10@70&10@
Covert Mfg. Co., Gate and Scuttle Hooks.....	40%
Ft. Madison Cut-Easy Cut, Holes, P. doz. 3.25 net	
Bench Hooks—See Bench Stops.	
Corn Hooks—See Knives, Corn.	
Horse Nails—	
See Nails, Horse.	
Horseshoes—	
See Shoes, Horses.	
Hose, Rubber—	
Garden Hose, $\frac{3}{4}$ -inch:	
Competition..... ft. 5 @ 6	
S-ply Guaranteed, ft. 8 @ 9	
4-ply Guaranteed, ft. 10 @ 11	
Cotton Garden, $\frac{3}{4}$ -in. coupled:	
Low Grade..... ft. 8 @ 9	
Fair Quality..... ft. 10 @ 11	
Irons—Sad—	
From $\frac{1}{2}$ to 10..... lb. 3 @ 3.5	
B. B. Sad Irons..... lb. 3.5@3.5	
Mrs. Potts', cents per set:	
Nos. 50 55 60 65	
Jap'd Tops.....	60 62 75 78
Tin'd Tops.....	70 67 80 77
New England Pressing, lb. 3.5@4.5	
Pinking—	
Pinking Irons.....	doz. 60¢
Irons, Soldering	
See Copper.	
Jacks, Wagon—	
Covert Mfg. Co.:	
Auto Screw..... 30&2%; Steel, 45%	
Lockport..... 50%	
Lane's Steel..... 30&10&2%	
Richards' Tiger Steel, No. 130..... 50&10%	
Snell & Hemmenway Co.'s..... 25%	
Kettles—	
Brass, Spun, Plain..... 20@25%	
Enamelled and Cast Iron—See Ware, Hollow.	
Knives—	
Butcher, Kitchen, &c.—	
Foster Bros., Butcher, &c.	50%
Wilkinson Shear & Cutlery Co.	60%
Corn—	
Wilkinson Shear & Cutlery Co., Wilkbrand Knives and Hooks 60% Wilkington Acme, P. doz. \$2.65;	
Dent, \$2.75; Adj. Serrated, \$2.20;	
Serrated \$2.10; Yankee No. 1, \$1.50; Yankees No. 2, \$1.15.	
Drawing—	
Standard List..... 75&5@75&10%	
C. E. Jennings & Co., Nos. 45, 46, 50, Jennings' Nos. 1 and 4.....	35&5
Jennings & Griffin, Nos. 41, 42, 45, Millers Falls, Upright, \$2.65; Angular, \$2.90	
Swan's..... 70	
Watrous..... 16%	
L. & J. T. White..... 20&5@25%	
Hay and Straw—	
Serrated Edge, per doz. \$5.75@6.00	
Iwan's Sickle Edge..... P. doz. \$9.50	
Iwan's Serrated..... P. doz. \$10.00	
Mincing—	
Buffalo..... P. gro. \$13.00	
Miscellaneous—	
Farrer's..... doz. \$3.00@3.25	
Wostenholm's..... P. doz. \$3.00@3.25	
Knobs—	
Base, $\frac{1}{2}$ -inch, Birch, or Maple, Rubber Tip..... gro. \$1.25@\$1.40	
Carriage, Jap., all sizes..... gro. 40@45¢	
Door, Mineral..... doz. 65@70%	
Door, Por., Nickel, doz. \$8.05@8.15	
Door, Por., Nickel, doz. \$8.05@8.15	
Bardale's Wood Door, Shutters, &c. 15%	
Lacing, Leather—	
See Belting, Leather—	
Ladders, Store, &c.—	
Allith Mfg. Co., Reliable..... 50%	
Lane's Store..... 25%	
Myers' Noiseless Store Ladders..... 50%	
Richards Mfg. Co.: Improved Noiseless, No. 113..... 50%	
Climax Shelf, No. 113..... 50%	
Trolley, No. 109..... 50%	
Ladies, Melting—	
L. & G. Mfg. Co. (low list)..... 25%	
P. S. & W. Reading..... 40&10%	
Lanterns—Tubular—	
Regular Tubular, No. 0..... doz. 8.25@4.50	
Lift Tubular, No. 0..... doz. 8.75@5.00	
Hinge Tubular, No. 0..... doz. 8.75@5.00	
Other Styles..... 40@465%	
Bull's Eye Police—	
No. 1, $\frac{3}{4}$ -inch..... \$2.75@3.00	
No. 2, 3-inch..... \$3.00@3.25	
Lasts and Stands, Shoe—	
Stowell's Atlas, Malleable Iron..... 50%	
Stowell's Badger, Cast Iron..... 50%	
Latches—Thumb—	
Roggins' Latches, with screw..... doz. 35@40	
Door—	
Allith Mfg. Co., Automatic, No. 400, P. doz.	\$4.00
Cronk & Carrier Mfg. Co., No. 101, P. doz.	\$2.30
Cronk & Carrier Mfg. Co., Latch, Hasp and Staples..... 50%	
Richards' Bull Dog, Henry, No. 125..... 50&5%	
Richards' Trump, No. 127..... 11.50	
Stowell's Steel..... 50%	
Leaders, Cattle—	
Small..... doz. 50¢; large, 60¢	
Cover Mfg. Co.: Cotton, 45%; Hemp, 45%; Jute, 35%; Sisal, 20%	
Lifters, Transom—	
R. & E.	10%
Lines—	
Wire Clothes, Nos. 18 19 20 100 feet..... \$2.25 £.00 1.75 75 feet..... \$1.75 1.35 1.10	
Aniston Waterproof Clothes, 50 ft., P. gro. \$25.00; Gilt Edge, \$23.00; Air Line, \$21.00; Acme, \$18.00; Alabama, \$17.00; Empire, \$16.00; Advance, \$14.00; Eclipse, \$13.50; Chicago, \$11.50; Standard, \$10.50; Columbia, \$9.50; Alston, \$13.50; Calhoun, \$12.00. Samson Cordage Works: Solid Braided Chalk, Nos. 0 to 3, 40%; Solid Braided Masons..... 50%	
Silver Lake Braided Chalk, No. 0, \$6.00; No. 1, \$6.50; No. 2, \$7.00; No. 3, \$7.50; No. 4, \$8.00; No. 5, \$8.50; No. 6, \$9.00; No. 7, \$9.50; No. 8, \$10.00; No. 9, \$10.50; No. 10, \$11.00; No. 11, \$11.50; No. 12, \$12.00; No. 13, \$12.50; No. 14, \$13.00; No. 15, \$13.50; No. 16, \$14.00; No. 17, \$14.50; No. 18, \$15.00; No. 19, \$15.50; No. 20, \$16.00; No. 21, \$16.50; No. 22, \$17.00; No. 23, \$17.50; No. 24, \$18.00; No. 25, \$18.50; No. 26, \$19.00; No. 27, \$19.50; No. 28, \$20.00; No. 29, \$20.50; No. 30, \$21.00; No. 31, \$21.50; No. 32, \$22.00; No. 33, \$22.50; No. 34, \$23.00; No. 35, \$23.50; No. 36, \$24.00; No. 37, \$24.50; No. 38, \$25.00; No. 39, \$25.50; No. 40, \$26.00; No. 41, \$26.50; No. 42, \$27.00; No. 43, \$27.50; No. 44, \$28.00; No. 45, \$28.50; No. 46, \$29.00; No. 47, \$29.50; No. 48, \$30.00; No. 49, \$30.50; No. 50, \$31.00; No. 51, \$31.50; No. 52, \$32.00; No. 53, \$32.50; No. 54, \$33.00; No. 55, \$33.50; No. 56, \$34.00; No. 57, \$34.50; No. 58, \$35.00; No. 59, \$35.50; No. 60, \$36.00; No. 61, \$36.50; No. 62, \$37.00; No. 63, \$37.50; No. 64, \$38.00; No. 65, \$38.50; No. 66, \$39.00; No. 67, \$39.50; No. 68, \$40.00; No. 69, \$40.50; No. 70, \$41.00; No. 71, \$41.50; No. 72, \$42.00; No. 73, \$42.50; No. 74, \$43.00; No. 75, \$43.50; No. 76, \$44.00; No. 77, \$44.50; No. 78, \$45.00; No. 79, \$45.50; No. 80, \$46.00; No. 81, \$46.50; No. 82, \$47.00; No. 83, \$47.50; No. 84, \$48.00; No. 85, \$48.50; No. 86, \$49.00; No. 87, \$49.50; No. 88, \$50.00; No. 89, \$50.50; No. 90, \$51.00; No. 91, \$51.50; No. 92, \$52.00; No. 93, \$52.50; No. 94, \$53.00; No. 95, \$53.50; No. 96, \$54.00; No. 97, \$54.50; No. 98, \$55.00; No. 99, \$55.50; No. 100, \$56.00; No. 101, \$56.50; No. 102, \$57.00; No. 103, \$57.50; No. 104, \$58.00; No. 105, \$58.50; No. 106, \$59.00; No. 107, \$59.50; No. 108, \$60.00; No. 109, \$60.50; No. 110, \$61.00; No. 111, \$61.50; No. 112, \$62.00; No. 113, \$62.50; No. 114, \$63.00; No. 115, \$63.50; No. 116, \$64.00; No. 117, \$64.50; No. 118, \$65.00; No. 119, \$65.50; No. 120, \$66.00; No. 121, \$66.50; No. 122, \$67.00; No. 123, \$67.50; No. 124, \$68.00; No. 125, \$68.50; No. 126, \$69.00; No. 127, \$69.50; No. 128, \$70.00; No. 129, \$70.50; No. 130, \$71.00; No. 131, \$71.50; No. 132, \$72.00; No. 133, \$72.50; No. 134, \$73.00; No. 135, \$73.50; No. 136, \$74.00; No. 137, \$74.50; No. 138, \$75.00; No. 139, \$75.50; No. 140, \$76.00; No. 141, \$76.50; No. 142, \$77.00; No. 143, \$77.50; No. 144, \$78.00; No. 145, \$78.50; No. 146, \$79.00; No. 147, \$79.50; No. 148, \$80.00; No. 149, \$80.50; No. 150, \$81.00; No. 151, \$81.50; No. 152, \$82.00; No. 153, \$82.50; No. 154, \$83.00; No. 155, \$83.50; No. 156, \$84.00; No. 157, \$84.50; No. 158, \$85.00; No. 159, \$85.50; No. 160, \$86.00; No. 161, \$86.50; No. 162, \$87.00; No. 163, \$87.50; No. 164, \$88.00; No. 165, \$88.50; No. 166, \$89.00; No. 167, \$89.50; No. 168, \$90.00; No. 169, \$90.50; No. 170, \$91.00; No. 171, \$91.50; No. 172, \$92.00; No. 173, \$92.50; No. 174, \$93.00; No. 175, \$93.50; No. 176, \$94.00; No. 177, \$94.50; No. 178, \$95.00; No. 179, \$95.50; No. 180, \$96.00; No. 181, \$96.50; No. 182, \$97.00; No. 183, \$97.50; No. 184, \$98.00; No. 185, \$98.50; No. 186, \$99.00; No. 187, \$99.50; No. 188, \$100.00; No. 189, \$100.50; No. 190, \$101.00; No. 191, \$101.50; No. 192, \$102.00; No. 193, \$102.50; No. 194, \$103.00; No. 195, \$103.50; No. 196, \$104.00; No. 197, \$104.50; No. 198, \$105.00; No. 199, \$105.50; No. 200, \$106.00; No. 201, \$106.50; No. 202, \$107.00; No. 203, \$107.50; No. 204, \$108.00; No. 205, \$108.50; No. 206, \$109.00; No. 207, \$109.50; No. 208, \$110.00; No. 209, \$110.50; No. 210, \$111.00; No. 211, \$111.50; No. 212, \$112.00; No. 213, \$112.50; No. 214, \$113.00; No. 215, \$113.50; No. 216, \$114.00; No. 217, \$114.50; No. 218, \$115.00; No. 219, \$115.50; No. 220, \$116.00; No. 221, \$116.50; No. 222, \$117.00; No. 223, \$117.50; No. 224, \$118.00; No. 225, \$118.50; No. 226, \$119.00; No. 227, \$119.50; No. 228, \$120.00; No. 229, \$120.50; No. 230, \$121.00; No. 231, \$121.50; No. 232, \$122.00; No. 233, \$122.50; No. 234, \$123.00; No. 235, \$123.50; No. 236, \$124.00; No. 237, \$124.50; No. 238, \$125.00; No. 239, \$125.50; No. 240, \$126.00; No. 241, \$126.50; No. 242, \$127.00; No. 243, \$127.50; No. 244, \$128.00; No. 245, \$128.50; No. 246, \$129.00; No. 247, \$129.50; No. 248, \$130.00; No. 249, \$130.50; No. 250, \$131.00; No. 251, \$131.50; No. 252, \$132.00; No. 253, \$132.50; No. 254, \$133.00; No. 255, \$133.50; No. 256, \$134.00; No. 257, \$134.50; No. 258, \$135.00; No. 259, \$135.50; No. 260, \$136.00; No. 261, \$136.50; No. 262, \$137.00; No. 263, \$137.50; No. 264, \$138.00; No. 265, \$138.50; No. 266, \$139.00; No. 267, \$139.50; No. 268, \$140.00; No. 269, \$140.50; No. 270, \$141.00; No. 271, \$141.50; No. 272, \$142.00; No. 273, \$142.50; No. 274, \$143.00; No. 275, \$143.50; No. 276, \$144.00; No. 277, \$144.50; No. 278, \$145.00; No. 279, \$145.50; No. 280, \$146.00; No. 281, \$146.50; No. 282, \$147.00; No. 283, \$147.50; No. 284, \$148.00; No. 285, \$148.50; No. 286, \$149.00; No. 287, \$149.50; No. 288, \$150.00; No. 289, \$150.50; No. 290, \$151.00; No. 291, \$151.50; No. 292, \$152.00; No. 293, \$152.50; No. 294, \$153.00; No. 295, \$153.50; No. 296, \$154.00; No. 297, \$154.50; No. 298, \$155.00; No. 299, \$155.50; No. 300, \$156.00; No. 301, \$156.50; No. 302, \$157.00; No. 303, \$157.50; No. 304, \$158.00; No. 305, \$158.50; No. 306, \$159.00; No. 307, \$159.50; No. 308, \$160.00; No. 309, \$160.50; No. 310, \$161.00; No. 311, \$161.50; No. 312, \$162.00; No. 313, \$162.50; No. 314, \$163.00; No. 315, \$163.50; No. 316, \$164.00; No. 317, \$164.50; No. 318, \$165.00; No. 319, \$165.50; No. 320, \$166.00; No. 321, \$166.50; No. 322, \$167.00; No. 323, \$167.50; No. 324, \$168.00; No. 325, \$168.50; No. 326, \$169.00; No. 327, \$169.50; No. 328, \$170.00; No. 329, \$170.50; No. 330, \$171.00; No. 331, \$171.50; No. 332, \$172.00; No. 333, \$172.50; No. 334, \$173.00; No. 335, \$173.50; No. 336, \$174.00; No. 337, \$174.50; No. 338, \$175.00; No. 339, \$175.50; No. 340, \$176.00; No. 341, \$176.50; No. 342, \$177.00; No. 34	

Reading 75..... \$6.25
Rocking Table..... \$6.20
Turn Table '96..... \$6.00
White Mountain..... \$5.00

Potato—

Saratoga..... \$7.00
White Mountain..... \$6.00

Picks and Mattocks—

List, Feb. 23, 1899..... 75@75¢
Cronk's Handled Garden Mattock,
\$1 doz.; No. 2, \$2.00; No. 3, \$4.40.

Pinking Irons—

See Irons, Pinking.

Pins, Escutcheon—

Brass..... 50¢@1000%
Iron, list Nov. 11, '85..... 60@100%&10%

Pipe, Cast Iron Soil—

Carload lots.

Standard, 2-6 in. 50¢@10@50¢@10¢
Extra Heavy, 2-6 in..... 65@10%
Fittings..... 70@10@70¢@10¢

Pipe, Merchant—

Consumers, Carloads.
Steel, Iron.

Bik. Galv. Bik. Galv.
1/8 in. & 1/4 in. 65¢ 53¢ 64.5¢ 48.5%
1/2 in. 71¢ 57¢ 64.5¢ 56.5%
1/2 in. 73¢ 61¢ 72.5¢ 62.5%
3/4 in. to 6 in. 77¢ 67¢ 72.5¢ 62.5%
7 to 12 in. 72% 57¢ 68% 53%
2

Pipe, Vitrified Sewer—

Carload lots.

Standard Pipe and Fittings, 3
to 24 in., f.o.b. factory:
First-class..... 85@86%
Second-class..... 90%
NOTE.—Market irregular.

Pipe, Stove—

Per 100 joints.

Edwards' Nested: C. L. L. C. L.
5 in. Standard Blue..... \$6.25 \$7.25
6 in. Standard Blue..... 6.75 7.75
7 in. Standard Blue..... 7.75 8.75
5 in. Royal Blue..... 7.00 8.00
6 in. Royal Blue..... 7.50 8.50
7 in. Royal Blue..... 8.50 9.50

Planes and Plane Irons—**Wood Planes—**

Bench, first qual..... 35@35¢@10%
Bench, second qual..... 45@45¢@10%
Molding..... 30@30¢@10%
Bailey's (Stanley R. & L. Co.) 35&2%
Chapin-Stephens Co.:
Bench, First Quality..... 35%
Bench, Second Quality..... 45%
Molding and Miscellaneous..... 30%
Toy and German..... 35%
Union 60%

Iron Planes—

Bailey's (Stanley R. & L. Co.) 35%
Chapin's Iron Planes..... 50&1%
Miscellaneous Planes (Stanley R. &
L. Co.) 30&5%
Union 60%

Plane Irons—

Wood Bench Plane Ir.'s..... 25@25¢@10%
Buck Bros..... 30%
Chapin-Stephens Co..... 25%
Stanley R. & L. Co..... 35%
L. & J. White..... 20@20%
Union 60%

Planters, Corn, Hand—

Kohler's Eclipse..... \$1 doz. \$8.00
Plates—
Fellow..... lb. 4@4¢
Self-Sealing Pie Plates (R. M.
Co.), \$1 doz. \$2.00..... 50%

Pliers and Nippers—

Button Pliers..... 75@10@75, 10, 5%
Gas Burner, per doz., 5 in., \$1.25
@ \$1.25; 6 in., \$1.45@ \$1.50.
Gas Pipe..... 7 8 10 12-in.
\$2.00 \$2.25 \$2.75 \$3.50

Acme Nippers—

Cronk & Carrier Mfg. Co.:
American Button..... 75@10%
Cronk's..... 50%
Stub's Pattern..... 50%
Combination and others..... 33%
Heller's Farriers' Nippers, Pinchers
and Tools..... 40&5@40&10%&5%
The Nettleton Mfg. Co. Reversible
Cutting Nippers..... 40%
P. S. & W. Tinner's Cutting Nip-
pers..... 30%
Wm. Schollhorn Co.:
Bernard, 33%; Elm City, 33%;
Paragon, 50%; Lodi, 50%.

Swedish Side End and Diagonal Cut-

ting Pliers..... 50%
Utica Drop Forge & Tool Co.:
Pliers and Nippers, all kinds..... 40%
Plumbs and Levels—

Chapin-Stephens Co.:
Plumbs and Levels..... 30@30¢@10%
Chapin's Imp. Brass Cor. 40@40&10%
Pocket Levels..... 30@30¢@10%
Extension Sights..... 30@30¢@10%
Machinist's Levels..... 40%
Diston's Plumbs and Levels..... 67%
C. E. Jennings & Co.'s Iron, Adhesive
able..... 40&7%
Stanley R. & L. Co..... 40%
Stanley's Duplex..... 50%
Woods' Extension..... 30%
Poachers, Egg—

Buffalo Steam Egg Poachers, \$1 doz.,
No. 1, \$6.00; No. 2, \$9.00; No. 3,
\$9.00; No. 4, \$12.00..... 50%

Points, Glaziers'—

Bulk and 1-lb. papers..... lb. 10¢
1/4-lb. papers..... lb. 9@10¢
1/4-lb. papers..... lb. 9@11¢

Pokes, Animal—

Ft. Madison Hawkeye..... \$1.25
Ft. Madison Western..... \$1.00

Police Goods—

Manufacturers' Lists..... 25@25¢@5%
Tower's 25%

Polish—Metal, Etc—

Glasbake, No. 2, 5 lb can (powder),
each, \$1.25; \$1 doz., \$12.00; No. 2, 10 lb
can (cake), each, \$2.50; \$1 doz., \$24.00.
Prestoline Liquid, No. 1 (1 pt.), \$1
doz., \$3.00; No. 2 (1 qt.), \$9.00. 40%
Prestoline Paste..... 40%

George William Hoffman:

U. S. Metal Polish Paste, 3 oz.
boxes, \$1 doz. 50¢; \$1 gro. 45¢;
1/2 lb boxes, \$1 doz. 1.25; 1 lb
boxes, \$1 doz. 2.25

U. S. Liquid, 8 oz cans, \$1 doz.,
\$1.25.

Barkeepers' Friend Metal Polish, \$1
doz., \$1.75.
Stove—Black Eagle Benzine Paste, 5 lb cans,
\$1 doz. 10¢
Black Eagle, Liquids, 1/2 pt. cans,
\$1 doz. 75¢
Black Jack Paste, 5 lb cans, \$1 gr.
Black Kid Paste, 5 lb can.... each, \$0.65
Ladd's Black Beauty Liquid, per
100 tins..... \$6.75
Joseph Dixon's, \$1 gr. \$5.75..... 10%

Dixon's Plumbeago, \$1 lb. 8¢

Fireside, \$1 gr. \$2.50

Gem, \$1 gr. \$1.50..... 10%

Japanese, \$1 gr. \$3.50

Jet Black, \$1 gr. \$3.50

Peerless Iron Enamel, 10 oz cans,
\$1 doz. 1.50
Wynn's Black Silk Paste, 5 oz.,
cans, \$1 doz. 5 oz., \$0.75;

1/2 lb, \$1.00; 1 lb, \$1.75

Paste, 5 lb can, \$0.70

Liquid, cans, \$1 doz. 6 oz., \$0.75;

1/2 pt., \$1.00; 1 pt., \$1.75

Steel Range Enamel, \$1 doz., 1/2 pt.,
\$1.00; 1/2 pt., \$2.00

Poppers, Corn—

1 qt., Square..... gro. \$3.00

1 qt., Round..... gro. \$3.00

1/2 qt., Square..... gro. \$10.00

2 qt., Square..... gro. \$12.00

Post Hole and Tree Au-
gers and Diggers—

See also Diggers, Post Hole, do.

Posts, Steel—Steel Fence Post, each, 5 ft., 42¢;
6 ft., 46¢; 6 1/2 ft., 48¢.

Steel Hitching Posts..... each \$1.30

Potato Parers—

See Parers, Potato.

Pots, Glue—Enamelled..... 30¢@10%

Tinned..... 35¢@10%

Powder—

In Canisters:

Duck, 1 lb..... each 45¢

Fine Sporting, 1 lb..... each 75¢

Rifle, 1/2 lb..... each 15¢

Rifle, 1 lb..... each 25¢

In Kegs:

12½-lb. kegs..... \$3.50

25-lb. kegs..... \$4.50

King's Semi-Smokeless:

Duck (1 lb bulk)..... \$6.50

Half Keg (12½ lb bulk)..... \$3.50

Quarter Keg (6½ lb bulk)..... \$1.90

Case 24 (1 lb cans bulk)..... \$8.50

Half case (1 lb cans bulk)..... \$4.50

King's Smokeless:

Shot Gun, Rifle.

Keg (25 lb bulk)..... \$12.00 \$15.00

Half Keg (12½ lb bulk)..... 6.25 7.75

King's Gun (6½ lb bulk)..... 3.25 4.00

Case 24 (1 lb cans bulk)..... 14.00 17.00

Half case 12 (1 lb cans bulk)..... 7.25 8.75

Robin Hood Sm'les Shot Gun..... 50¢@20%

Presses—**Fruit and Jelly—**

Enterprise Mfg. Co..... 20@25%

Sea! Presses—

Morrill's No. 1, \$1 doz. \$20.00..... 50%

Pruning Hooks and Shears**See Shears.****Pullers, Nail—**Cyclops, \$1 doz. 50%

Falls, No. 3, \$1 doz. \$12.00

Morrill's No. 1, Nail Puller, \$1 doz.
\$20.00
Pearson No. 1, Cyclone Spike Puller,
each \$30.00

Scranton, Case Lots:

No. 2B (large)..... \$3.50

No. 3B (small)..... \$3.00

Smith Household Co.:

Diamond B, case lots, \$1 doz., Large,
\$3.00; Small, \$1.50
Giant No. 1, \$1 doz., \$18; No. 1A,
\$16.50; No. 3, \$15..... 33%

Staple Pullers, Utica and Davi-
son

son

Parrot Tack and Stub Puller, \$1 doz.,
75¢; \$1 gro. \$3.00

Stowell's:

Cast Rail, \$1 ft. 24¢

Steel Rail, Plain, \$1 ft. 25¢

Wrought Bracket, 1 3/16 in., \$1 ft. 3¢

Screw Eye, \$1 ft. 1 1/2 in., \$1 ft. 1¢

Screw Eye, \$1 ft. 1 1/2 in., \$1 ft. 1¢

P. B. Steel Rail, \$100 ft. \$3.00

No. 1, 1 x 3-ft. 3¢

No. 2, 1 x 3-ft. 3.50

No. 3, 1 x 3-in. 3.50

Special Hinged Hanger Rail, \$6@10%

Lag Screw Rail, No. 65..... 50%

Gauge Trolley Track, \$1 ft. No. 31,
9¢; No. 32, 14¢; No. 33, 20¢

No. 50, 31¢

No. 61, \$3.00; 62, \$3.25; 63, \$3.50; 64,
\$4.00; 65, \$3.25; 66, \$3.50; 67, No. 1,
\$3.25; 68, No. 2, \$3.50

Stowell's:

Cast Rail, \$1 ft. 24¢

Steel Rail, Plain, \$1 ft. 25¢

Wrought Bracket, 1 3/16 in., \$1 ft. 3¢

Screw Eye, \$1 ft. 1 1/2 in., \$1 ft. 1¢

P. B. Steel Rail, \$100 ft. \$3.00

No. 1, 1 x 3-ft. 3¢

No. 2, 1 x 3-ft. 3.50

No. 3, 1 x 3-in. 3.50

No. 4, 1 x 3-in. 3.50

No. 50, 31¢

No. 61, \$3.00; 62, \$3.25; 63, \$3.50; 64,
\$4.00; 65, \$3.25; 66, \$3.50; 67, No. 1,
\$3.25; 68, No. 2, \$3.50

Kohler's:

Lawn Queen, 29-tooth.... \$9 doz. \$2.90

Lawn Queen, 24-tooth.... \$9 doz. \$3.00

Paragon, 20-tooth.... \$9 doz. \$2.70

Paragon, 24-tooth.... \$9 doz. \$2.75

Steel Garden, 14-tooth.... \$9 doz. \$2.40

Malleable Garden, 14-tooth.... \$9 doz. \$2.00

\$1.75@20%

Sash Pulleys—

Common Frame; Square or
Round End, per doz., 1/4 and 2 in.

2 in..... 16@15¢

Auging or Tackle, do.

doz. \$0.50 .45 .60 1.05

Hay Fork, Scythe or Solid Eye,
doz., 4 in., \$1.25; 5 in., \$1.65

Inch..... 2 1/2 2 1/2 2 1/2

Hot House, doz. \$0.65 .85 1.00

Inch..... 1/4 1/2 1/2 1/2

Screws, doz. \$0.16 .19 .23 .30

Inch..... 1/4 1/2 1/2 1/2

Side, doz. \$0.25 .30 .35 .40

Inch..... 1/2 1/2 1/2 1/2

Screws, doz. \$0.16 .19 .23 .30

Inch..... 1/2 1/2 1/2 1/2

Side, doz. \$0.25 .30 .35 .40

Inch..... 1/2 1/2 1/2 1/2

Screws, doz. \$0.16 .19 .23 .30

Inch..... 1/2 1/2 1/2 1/2

Side, doz. \$0.25 .30 .35 .40

Inch..... 1/2 1/2 1/2 1/2

Screws, doz. \$0.16 .19 .23 .30

Inch..... 1/2 1/2 1/2 1/2

Side, doz. \$0.25 .30 .35 .40

Inch..... 1/2 1/2 1/2 1/2

Screws, doz. \$0.16 .19 .23 .30

Inch..... 1/2 1/2 1/2 1/2

Side, doz. \$0.25 .30 .35 .40

Inch..... 1/2 1/2 1/2 1/2

Screws, doz. \$0.16 .19 .23 .30

Inch..... 1/2 1/2 1/2 1/2

Side, doz. \$0.25 .30 .35 .40

Inch..... 1/2 1/2 1/2

Rules

Bowwood	.60@60&10%
Ivory	.35d 10@35d 10&5%
Chapin-Stephens Co.:	
Boxwood	.60%
Flexifold	.27d 10&10%
Ivory	.35d 10&10%
Miscellaneous	.50@50&10&10%
Stephens' Combination	.55@55&10%
Standard	.10@10&10%
Kent & East Co.:	
Folding, Wood	.35&10%
Folding, Steel	.33d 10&10%
Lufkin's Steel	.50&10%
Lufkin's Lumber	.60%
Stanley R. & L. Co.:	
Boxwood	.60%
Ivory	.45%
Miscellaneous	.60%
Zig Zag	.40%
Zig Zag, Pin Joint	.42%
Upson Nut Co.:	
Boxwood	.60@60&10%
Ivory	.35d 10@35d 10&10%

Sash Balances—

See Balance, Sash.

Sash Locks—

See Locks, Sash.

Sash Weights—

See Weights, Sash.

Sausage Stuffers or Fillers

See Stuffers or Fillers, Sausage.

Saw Frames—

See Frames, Saw.

Saw Sets— See Sets, Saw.**Saw Tools—** See Tools, Saw.**Saws—**

Atkins': Circular	.50%
Band	.50&10&5%
Cross Cuts	.35d 10%
Mulay, Mill and Drag	.50%
One-Man Saw	.40%; Wood, .40%; Hand, Compas, &c., .40%.
Chapin-Stephens Co.:	
Turning Saws and Frames	.30@30&10%
Diamond Saw & Stamping Works:	
Sterling Kitchen Saws	.30@10&10%
Douston's:	
Circular, Solid and Ins'ted Tooth	.50%
Band, 2 to 14 in. wide	.60%
Band, 14 to 1%	.60%
Crosscuts	.45%
Narrow Crosscuts	.50%
Mulay, Mill and Drag	.50%
Framed Woodsaws	.25%
Woodsaw Blades	.25%
Woodsaw Heads	.25%
Hand Saws, Nos. 12, 30, 9, 16, d100	
D8, 120, 76, 17, 8	.25%
Hand Saws, Nos. 7, 107, 107%, 3, 1, 0, 0, Combination	.30%
Compas, Key Hole, &c.	.25%
Butcher Saws and Blades	.30%
C. E. Jennings & Co.'s:	
Back Saws	.25%
Butcher Saws	.30%
Compass and Key Hole Saws	.35d 10%
Framed Wood Saws	.35d 10%
Hand Saws	.25d 10%
Wood Saw Blades	.32d 10%
Millers Fall Saws	
Butcher Saws	.15&10%
Star Saw Blades	.15d 10%
Massachusetts Saw Works:	
Victor Kitchen Saws	.40d@10&50%
Butcher Saw Blades	.35d 40%
Pace & Richardson's Hand Saws	.30%
Simonds': Circular Saws	.50%
Crescent Ground Cross Cut Saws	.35%
One-Man Cross Cuts	.40&10%
Gang Mill, Mulay and Drag Saws	.50%
Band Saws	.50%
Back Saws	.25d 25&7%
Butcher Saws	.35d 35&7%
Hand Saws	.25d 25&7%
Hand Saws, Bay State Brand	.45%
Compass, Key Hole, &c.	.25d 25&7%
Wood Saws	.40d 7%
Wheeler, Madden & Clemens Mfg. Co.'s Cross Cut Saws	.50%
Hack Saw Blades and Frames	
Atkins' Hack Saw Blades A A A 35%	
Concave Blades	.25%
Keystone Blades	.35%
Hack Saw Frames	.30%
Fitchburg File Works, The Best	.35%
C. E. Jennings & Co.'s:	
Hack Saw Frames, Nos. 175, 180	.40d 7%
Hack Saws, Nos. 175, 180, complete	.40d 7%
Goodell's Hack Saw Blades	.50d 10%
Griffith's Hack Saw Frames	.35d 10&10%
Griffith's Hack Saw Blades	.35d 10&10%
Star Hack Saws and Blades	.15d 10%
Sterling Hack Saw Blades	.30d 10&5%
Sterling Hack Saw Frames	.30d 10&10%
Sterling Power Hack Saws	.10d 10%
each, No. 1, \$25.00; No. 2, \$30.00, 10%	
Victor Hack Saw Blades	.25%
Victor Hack Saw Frames	.40%
Scroll—	
Barnes, No. 7, \$15	.25%
Barnes' Scroll Saw Blades	.40%
Barnes' Velocipede Power Scroll Saw, without boring attachment	.15%
with boring attachment	.20%
Lester, complete	.10.00
Rogers, complete	\$3.50 and .15d 10%
Scales—	
Family, Turnbull's	.50@50d 10%
Counter:	
Hatch, Platform, 1/2 oz. to 1 lbs.	.doz. \$5.50
Tico Platforms, 1/2 oz. to 1 lbs.	.doz. \$16.00
Union Platform, Plain	\$1.70@1.90
Union Platform, Std. \$1.85@2.15	
Chatillon's:	
Eureka	.35%
Favorite	.40%
Crocer's Trip Scales	.50%
Chicago Scale Co.:	
The Little Detective	.25 lbs 50%
Union or Family No. 2	.50%
Portable Platform (reduced list)	.50%
Wagon or Stock (reduced list)	.50d 50%
The Standard Portables	.45%
The Standard R. R. and Wagons	.50d 10%

Scales—

Family, Turnbull's	.50@50d 10%
Counter:	
Hatch, Platform, 1/2 oz. to 1 lbs.	.doz. \$5.50
Tico Platforms, 1/2 oz. to 1 lbs.	.doz. \$16.00
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Wagon or Stock (reduced list)	.50d 50%
The Standard Portables	.45%
The Standard R. R. and Wagons	.50d 10%

Scrapers—

Box, 1 Handle	.doz. \$2.00@2.25
Box, 2 Handle	.doz. \$3.50@2.60
Ship	.Light, \$2.00; Heavy, \$4.50
Adjustable Box Scraper (S. R. & L. Co.)	.60.00
Chapin-Stephens Co. Box	.45%
30@30&10&10%	

Screws—Bench and Hand

Bench, Iron, doz. 1 in.	\$2.50@2.75; 1/4, \$3.00@3.25; 1/4, \$3.50@3.75
Bench Wood	.25@2d 5%
Hand, Wood	.25@2d 5%
R. Bliss Mfg. Co. Hand, 20&5@20&10%	
Chapin-Stephens Co. Hand	.25%

Coach, Lag and Hand Rail

Lag, Cone Point, list Oct. 1, '99

.75d 15%

Coach, Gimlet Point, list Oct. 1, '99

.75d 10%

Hand Rail, list Jan. 1, '01

.70d 10@75%

Jack Screws—

Standard List

.75%

Millers Falls

.50@10&10%

P. S. & W.

.50%

Swett Iron Works

.75@80%

Machine

List Jan. 1, '00

Flat or Round Head, Iron

.50@50&10%

Flat or Round Head, Brass

.50@50&10%

Set and Cap

Set (Iron) .75d 10&7%

Set (Steel), net advance over

Iron .75d 10&7%

Sq. Hd. Cap .70d 10&7%

Hex. Hd. Cap .70d 10&7%

Rd. Hd. Cap .70d 10&7%

Fillister Hd. Cap .60d 7%

Wood—

List July 23, 1903

Flat Head, Iron .87d 10@10%

Round Head, Iron .85 d 10@10%

Flat Head, Brass .82d 10@10%

Round Head, Brass .80 d 10@10%

Round Head, Bronze .77d 10@10%

Round Head, Bronze .75 d 10@10%

Drive Screws .87d 10@10%

Scroll Saws—

See Saws, Scroll.

Scythes—

Per doz.

Grass, No. 1, Plain .86.25@6.75

Clipper, Bronzed Webb .65.50@7.00

No. 3 Clipper, Pol'd Webb .66.75@7.25

No. 6 Clipper and Solid Stee.

.70.00@7.50

Bush, Weed and Bramble, No. 2

.66.50@7.00

Grain, No. 1 .88.25@8.75

Bronzed Webb, No. 1 .88.50@9.00

Nos. 3 and 4 Clipper, Grain .88.75@9.25

Solid Steel, No. 6 .89.25@9.75

Seeders, Raisin—

Enterprise .25@30%

Sets—Awl and Tool—

Fray's Adi. Tool Handles, Nos. 1, \$12;

2, \$18; 3, \$12; 4, \$9; 5, \$11. .50%

C. E. Jennings & Co.'s Model Tool Holders .30%

Millers Falls Adi. Tool Handles, No. 1, \$12; No. 2, \$14; No. 3, \$18; No. 4, \$20; .15&10%

Garden Tool Sets—

Ft. Madison Three Plows, Hoe, Rake and Shovel. .10 per doz. \$9.00

Sets, Nail—

Octagon .90. gro. \$3.50@3.75

Buck Bros. .21%

Cannon's Diamond Point, \$9.00@12.40

Mayhew's .90. gro. \$9.00

Snell's Cor'gated, Cup Pt. .90. gro. \$7.20

Snell's Knurled, Cup Pt. .90. gro. \$7.50

Victor Knurled Cup Pt. .90. gro. \$7.50

Rivet—

Regular list .75@75&10%

Saw—

Atkin's:

Criterion .40%

Adjustable .40%

Douston's Star, Monarch and Tri-umph .30%

Morrill's No. 1 .15.00

Nos. 3 and 4, Cross Cut .20.60

No. 5, Mill .30.00

Nos. 10, 11, 95 .15.60

No. 1 Old Style .10.00

Special .16.25

Giant Royal Cross Cut .90. gro. \$8.00

Royal, Hand .90. gro. \$4.50

Taintor Pliers .90. gro. \$5.75

Shaving—

Fox Shaving Sets, No. 30.

.90. doz. net, \$24.00

Smith & Hemenway Co.'s .60%

Sharpeners, Knife—

Chicago Wheel & Mfg. Co. .70%

Pike Mfg. Co.:

Fast Cut Pocket Knife Hones, .90. doz.

Mounted Kitchen Sand Stone, .90. doz.

Natural Grit Carving Knife Hones, .90. doz.

Quick Cut Emery Carving Knife Hones, .90. doz.

Quick Edge Pocket Knife Hones, .90. doz.

Skate—

Smith & Hemenway Co. Eureka. 20%

Shaves, Spoke—

Iron .doz. \$1.10@1.25

Wood .doz. \$1.75@2.25

Union Platform, Plain

\$1.70@1.90

Union Platform, Std. \$1.85@2.15**Chatillon's:**

Eureka .35%

Favorite .40%

Crocer's Trip Scales .50%

Chicago Scale Co.:

The Little Detective .25 lbs 50%

Union or Family No. 2 .50%

Portable Platform (reduced list) .50%

Wagon or Stock (reduced list) .50d 50%

The Standard Portables .45%

The Standard R. R. and Wagons .50d 10%

Scallop—

Barnes, No. 7, \$15 .25%

Barnes' Scroll Saw Blades .40%

Barnes' Velocipede Power Scroll Saw, without boring attachment .15%

